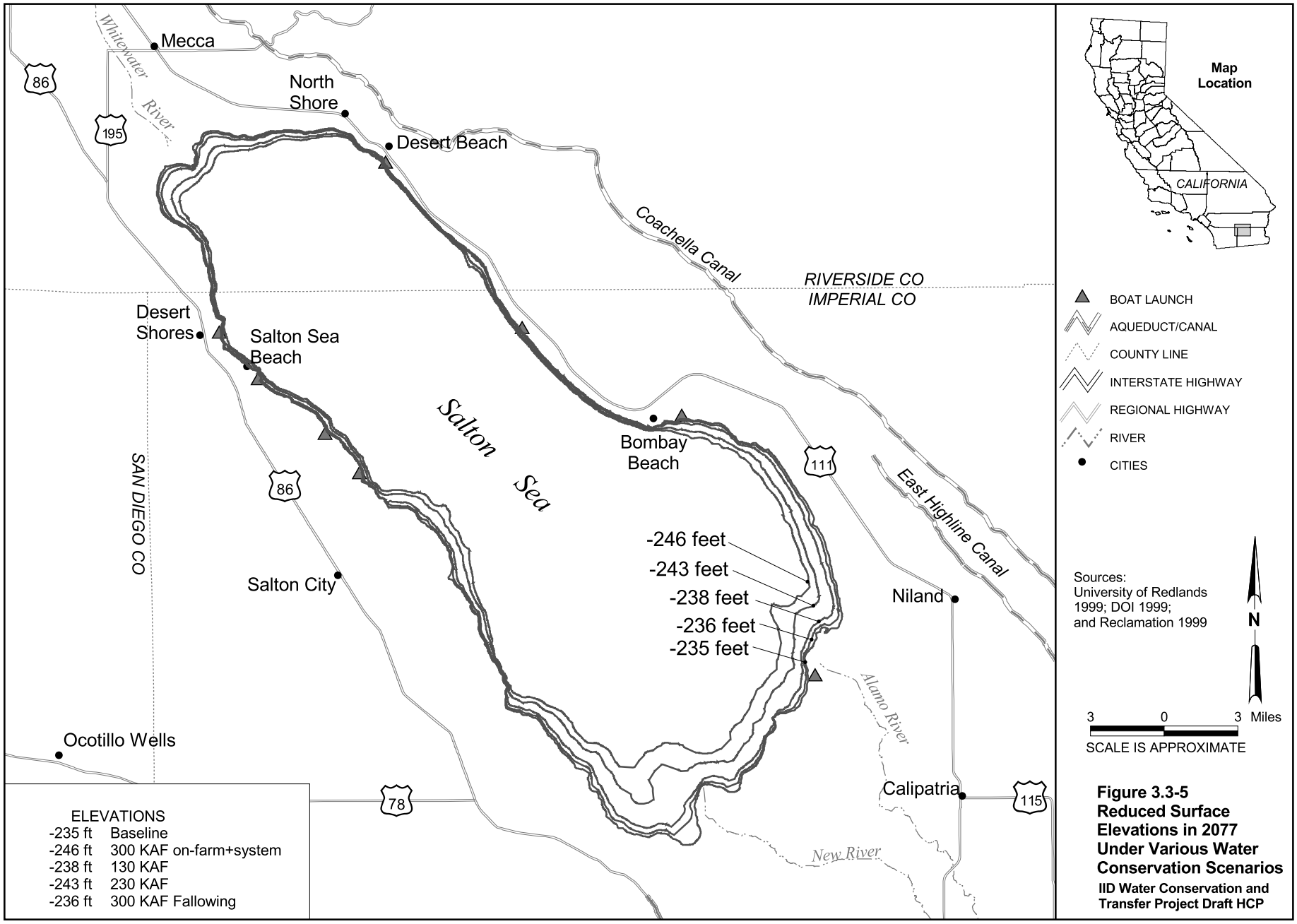



**Figure 3.3-5**
**Reduced Surface Elevations in 2077 Under Various Water Conservation Scenarios**
**IID Water Conservation and Transfer Project Draft HCP**

**TABLE 3.3-7**
Year When the Water Surface Elevation of the Salton Sea is Projected to Decline 2, 3, and 4 Feet Under the Baseline Condition and Various Water Conservation and Transfer Scenarios.

| | Elevation Decline | | |
|---|---|---|---|
| | **2 Feet** | **3 Feet** | **4 Feet** |
| Baseline | 2006 | 2010 | 2015 |
| 130 to SDCWA | 2005 | 2007 | 2008 |
| 230 to | 2005 | 2007 | 2008 |
| 300 to SDCWA | 2005 | 2007 | 2008 |
| 300 to SDCWA by Fallowing | 2006 | 2008 | 2011 |

### Tamarisk Scrub Shoreline Strand

Depending on the relationship between the water surface elevation of the Salton Sea and maintenance of the shoreline strand and adjacent wetlands, the water conservation program could cause changes in the amount of tamarisk scrub habitat in shoreline strand and adjacent wetland areas. There is, however, considerable uncertainty about the extent of these possible changes. As the sea recedes, tamarisk could establish at lower elevations, replacing vegetation lost at high elevations. Alternatively, it has been suggested that tamarisk will not establish in areas exposed by a receding sea level because of excessive soil salinity (Reclamation and SSA 2000). In areas where drain water or shallow groundwater is the predominant water source, no change in tamarisk-dominated adjacent wetlands is expected. It is currently not possible to predict the magnitude of changes in tamarisk in shoreline strand and adjacent wetland areas.

## 3.3.2.3 Other Covered Activities

Through their effect on the rate of salinization and surface elevation decline, water conservation and transfer activities are the primary covered activities anticipated to impact covered species associated with the Salton Sea. Table 3.3-8 summarizes the relationships of other covered activities to covered species associated with the Salton Sea.

**TABLE 3.3-8**
Potential Effects of Covered Activities on Covered Species Associated with the Salton Sea

| **Activity** | **Potential Effects (Positive and Negative)** |
|---|---|
| **Water Use and Conservation** | |
| Combined effects of on-farm and system-based water conservation | Water conservation could reduce the amount of water flowing to the Salton Sea and accelerate declines in sea elevation and accelerate the rate of salinization. |
| Installation of on-farm water conservation features | On-farm water conservation practices would be constructed within agricultural fields or their margins, removed from portions of the Salton Sea used by covered species. |

**TABLE 3.3-8**
Potential Effects of Covered Activities on Covered Species Associated with the Salton Sea

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| Installation of system-based water conservation features | System-based water conservation practices would be constructed within the Imperial Valley in association with IID's conveyance system and in agricultural fields and their margins. System-based conservation activities would not be conducted at the Salton Sea. |
| **Operation and Maintenance** | |
| Conveyance system operation | Conveyance system operation is limited to moving water through the canals to meet customer needs and to address maintenance requirements. Other than the filling, draining and moving water through the canals, no physical effects are encompassed by conveyance system operation. No effects to covered species associated with the Salton Sea would be expected. |
| **Drainage System Operation** | |
| Rerouting or constructing new drains | IID reroutes or constructs about 2 miles of drains every 10 years. During the term of the permit IID could reroute drains near the Salton Sea to ensure adequate drainage and to provide connectivity among drains for pupfish. However, given the infrequent, transient and localized nature of the activities, no effects to covered species associated with the Salton Sea would not be expected. |
| Piping drains | IID does not anticipated piping drains at the Salton Sea. |
| Inspection activities | Potential effects of inspection activities would be limited to a minor potential for disturbance of covered species if they occur in the vicinity of structures at the time of inspection. |
| Canal lining maintenance | Canal lining maintenance consists of repairing the concrete lining of canals only. Lined canals do not occur in portions of the Salton Sea used by covered species. |
| Right-of-way maintenance<br>Embankment maintenance<br>Erosion maintenance | Along drains, right-of-way maintenance, embankment maintenance and erosion maintenance is conducted in association with vegetation control/sediment removal along drains. Given the infrequent, transient and localized nature of the activities, no effects to covered species associated with the Salton Sea would be expected. |
| Seepage maintenance | Seepage maintenance is conducted only along the canal system and consists of repairing leaks. Few canals occur near the Salton Sea in areas used by covered species associated with the Salton Sea. Given the infrequent, transient and localized nature of the activities, no effects to covered species associated with the Salton Sea would be expected. |
| Structure maintenance | Few structures requiring replacement occur at the Salton Sea in areas used by covered species. With the infrequent, transient and localized nature of the activities, no effects to covered species associated with the Salton Sea would be expected. |
| Pipeline maintenance | No piped drains occur at the Salton Sea. |
| Reservoir maintenance | No reservoirs occur at the Salton Sea. |
| Sediment removal<br>Vegetation control | IID controls vegetation and removes sediment from drains that discharge directly to the sea. Because these activities are localized (within and immediately adjacent to the drain channels) and conducted relatively infrequently on drains discharging directly to the Sea (about once every 5 years), they have a minor potential to affect species associated with the Salton Sea. Effects to desert pupfish are addressed separately in Section 3.7. |

**TABLE 3.3-8**
Potential Effects of Covered Activities on Covered Species Associated with the Salton Sea

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| New and Alamo River maintenance | IID dredges the deltas of the New and Alamo rivers about once every four years. In conducting this dredging, IID retains the vegetation on the banks. Thus, habitat is not removed by these dredging operations, but the dredging could temporarily disturb covered species using the deltas. IID coordinates with USFWS at the refuge prior to conducting these activities. |
| Salton Sea dike maintenance | Salton Sea dike maintenance activities consist of replacing riprap, grooming embankments and repairing damaged sections of the dikes. With the infrequent, transient and localized nature of the activities, no effects to covered species associated with the Salton Sea would be expected. |
| Gravel and rock quarrying | IID quarries gravel and rock from two quarries adjacent to the Salton Sea (Red Hill and Pumice Island).The quarries are barren and do not support vegetation. Covered species associated with the Salton Sea are not known to occur at either of these quarries. |
| Fish hatchery operation and maintenance | The fish hatchery is located in the Imperial Valley, removed from the Salton Sea. |
| Recreational facilities | IID conducts dredging at Salton Sea Beach, Corvina Beach and Bombay Beach about every 60 days. IID also dredges at Red Hill Marina on request. This dredging presents a minor potential to displace birds that are foraging or resting on the water in the vicinity. The HCP does not cover take of covered species by recreationists. |
| HCP/EIS/EIR mitigation | IID would have the flexibility in locating specific HCP and EIR/EIS mitigation measures away from sensitive areas for covered species (e.g., nesting or roosting sites). |

## 3.3.3 Approach and Biological Goals

The overall goal of the Salton Sea Conservation Strategy is to maintain the same duration and level of use of the Salton Sea by covered piscivorous birds, to maintain viable populations of desert pupfish occupying the drains that discharge directly to the Sea, and to provide habitat to support the species composition and seasonal occurrence of riparian-associated covered species that could use tamarisk scrub habitat in the HCP Area. This overall goal is to be accomplished through implementing measures to meet the following specific objectives.

- Avoid and minimize the effects of increased salinity on the fish that provide the forage base for covered piscivorous birds using the Salton Sea
- Maintain connectivity and genetic exchange among populations of desert pupfish inhabiting the drains
- Avoid and minimize take of covered species associated with loss of tamarisk scrub habitat
- Create or acquire and preserve native tree habitat to mitigate any take of covered species caused by removal of tamarisk

### 3.3.4 Salton Sea Mitigation Measures

The water conservation and transfer program could affect covered species at the Salton Sea in two ways: acceleration in the rate at which salinity increases in the Salton Sea and a reduction of the surface elevation. The primary effect of increased salinity is the earlier loss of fish in the Sea and the loss of the forage base for covered piscivorous birds. The primary effects of a reduction in Sea elevation are the potential loss of tamarisk scrub habitat adjacent to the Sea used by covered species and creation of land bridges to islands used by covered species for nesting and roosting. The measures developed to address these potential impacts are presented below.

***Salton Sea–1.*** *IID will avoid and minimize the potential for take of covered piscivorous birds resulting from implementation of the water conservation and transfer project by acquiring and discharging additional water the Salton Sea. The amount of water discharged to the Sea will be sufficient to offset the reduction in inflow to the Salton Sea caused by the water conservation and transfer project and to maintain salinity in the Sea at or below 60 ppt until the year 2030. The annual amount of mitigation water discharged to the Sea will be equal to the actual discharge reduction caused by the water conservation and transfer program plus or minus any amount of water necessary to maintain the salinity trajectory of the 95 percent confidence bound under the baseline (Figure 3.3-6). IID will not be required to discharge water to the Sea for mitigation if the discharge of that water increases the surface elevation of the Salton Sea above the level established by the projected elevation change as shown for the Proposed Project in Figure 3.3-7. IID may discontinue to discharge water to the Salton Sea for mitigation prior to 2030 if a Salton Sea restoration project is implemented or if it can be demonstrated that tilapia can no longer reproduce successfully in the Sea.*

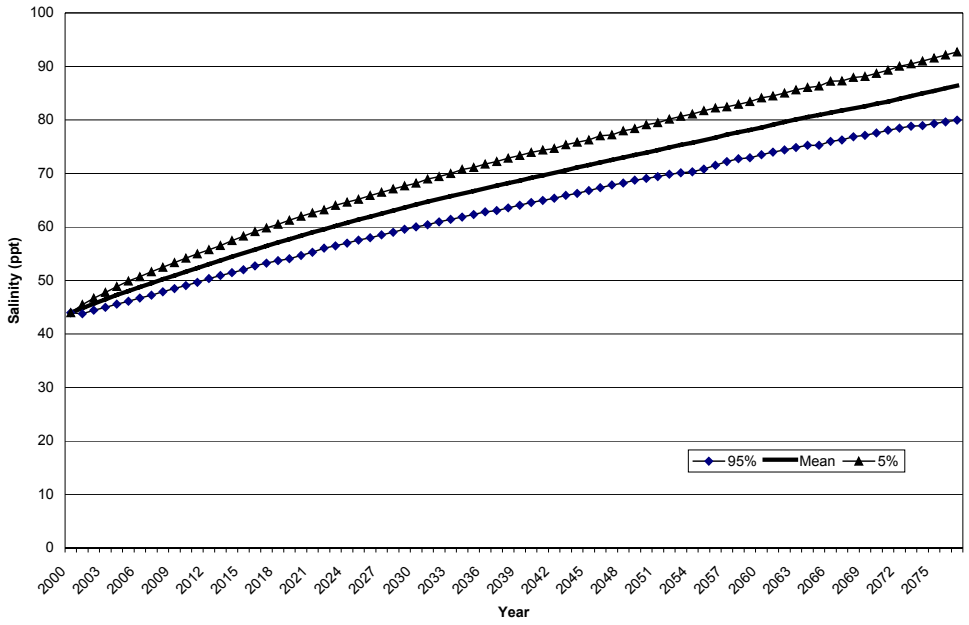



**FIGURE 3.3-6**
Salinity Projections in the Salton Sea Under the Baseline

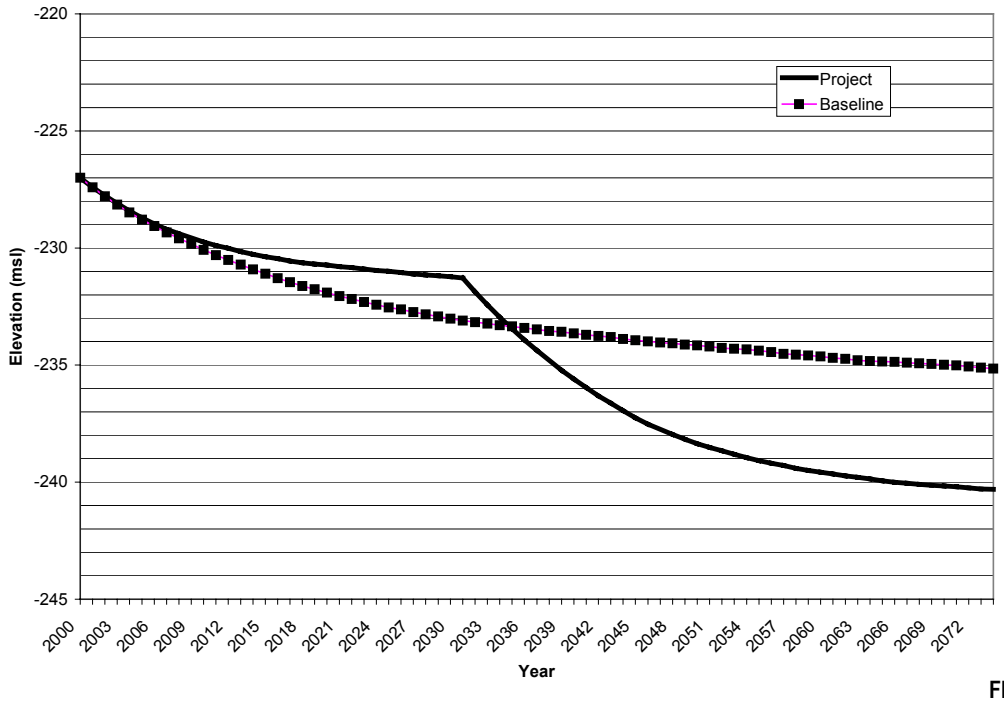



**FIGURE 3.3-7**

Projected Mean Water Surface Elevation of the Salton Sea Under the Proposed Project and the Baseline

Under this measure, IID would conserve and discharge water to the Salton Sea for the purpose of mitigating the impact of the water conservation and transfer program on salinity in the Sea and avoiding and minimizing the indirect effects on fish and covered piscivorous birds. The amount of water used to mitigate project effects on salinity and the number of years over which that water would be discharged to the Sea was based on the projection of when salinity in the Sea would reach a level at which tilapia could no longer reproduce. By maintaining suitable salinity conditions in the Sea, IID would ensure continued persistence of fish (and therefore piscivorous birds) for a period the same as that projected under the baseline. Under this strategy, the duration and level of use of the Salton Sea by piscivorous birds would be expected to be the same as under the Baseline.

Two elements of uncertainty were considered in defining the increment of impact associated with the water conservation and transfer component of the Proposed Project: (1) the uncertainty associated with the projection of when the salinity threshold (i.e., 60 ppt) for reduced fish reproduction would be reached and (2) the uncertainty associated with the accuracy of the threshold. The uncertainty associated with defining when the threshold would be reached was addressed through the modeling of the salinity in the Salton Sea. To account for the variability in the factors that influence salinity (e.g., hydrology), multiple runs of the Salton Sea model were made in which the variables were allowed to differ in each iteration. From these model runs, the probability (mean and 5/95 percent confidence bounds) of the projected salinity trajectory under the Salton Sea Baseline was determined (Figure 3.3-6). These projections indicate a 90 percent probability that the actual salinity trajectory will fall between the lines representing the 5 and 95 percent confidence bounds. The mean of the modeled projections indicated that salinity in the Salton Sea would reach 60 ppt under the Salton Sea Baseline in the year 2023. Thus, under the assumption that 60 ppt accurately represents the threshold above which fish production and bird use will

decline at the Sea, IID could avoid and minimize the impact of any Project-related take of piscivorous birds by maintaining salinity at levels less than 60 ppt until 2023.

As described in the HCP, the best available information suggests that growth, survival, and reproduction of tilapia would begin to decline at a salinity of about 60 ppt (Costa-Pierce and Riedel 2000a). However, because of the complexity of the Salton Sea ecosystem and other factors that contribute to reproductive success of tilapia, the actual threshold could be lower or higher than 60 ppt. Available data are insufficient to gain better precision on the threshold or to calculate confidence bounds. Because of the uncertainty associated with the salinity threshold for tilipia in the Salton Sea could not be quantified, a salinity of 60 ppt was used. This salinity value represents the best professional judgment of scientists very familiar with this species in the Salton Sea and because no information could be found in the scientific literature to suggest a different threshold should be used. The uncertainty associated with the model predictions was quantified in the form of 5- and 95-percent confidence intervals on the model projections. In order to allow the slowest reasonable increase in salinity under the Baseline guide mitigation requirements, the 95-percent confidence interval, which indicates that a salinity of 60 ppt would be exceeded in the year 2030, was used as the basis of the mitigation.

Under this revised strategy, IID would avoid the potential for take of covered piscivorous birds resulting from implementation of the water conservation and transfer component of the Project by discharging mitigation water to the Salton Sea. The amount of mitigation water would be sufficient to offset the reduction in inflow to the Salton Sea caused by the Proposed Project and to maintain salinity in the Sea at or below 60 ppt until the year 2030. The annual amount of mitigation water would be equal to the actual inflow reduction caused by the water conservation and transfer component of the Project plus or minus an amount of water necessary to maintain the target salinity trajectory. This trajectory would correspond to the salinity projection for the 95 percent confidence bound (see Figure 3.3-6) until 2030. However, because of the continued threat of potential flooding of lands adjacent to the Salton Sea, IID would not be required to discharge mitigation water to the Sea if the discharge of that water would increase the surface elevation of the Salton Sea above the levels established by the projected elevation change associated with the Proposed Project (Figure 3.3-7). That is, IID would not be required to discharge water to the Sea in years in which the elevation of the Sea was at or above the elevation projection for the Proposed Project described in Figure 3.3-7 due to unforeseen increases in elevation (e.g., increased inflow from a major storm event). In addition, IID could discontinue to discharge water to the Salton Sea for mitigation prior to 2030 if a Salton Sea restoration project were implemented or if it could be demonstrated that tilapia were no longer successfully reproducing in the Sea.

Mitigation water sources to offset Project-related inflow reductions could be acquired by IID by fallowing in the Imperial Valley or by using any other legally permissible water provided to IID for this purpose by other parties to the Quantification Settlement Agreement (QSA), by state or federal agencies, by any other third parties willing to contribute to the mitigation effort, or any combination of the foregoing. The use of water obtained by IID from sources outside the Imperial Valley could require appropriate subsequent environmental review. The amount of water discharged to the Sea would be calculated annually based on the proportion of efficiency conservation (e.g., system and on-farm) and fallowing used to generate the water for transfer. As previously described, the amount of water discharged

annually would match the anticipated Project-related reduction in inflow plus or minus any increment necessary to maintain the salinity trajectory, but not to exceed the elevation levels projected for the Project as described above.

By maintaining suitable salinity conditions in the Sea, IID would ensure continued persistence of fish (and therefore piscivorous birds covered by the HCP) for a period consistent with that projected under the Salton Sea Baseline. Under this approach, the level and duration of use of the Salton Sea by piscivorous birds would be expected to be the same as under the Salton Sea Baseline. In addition, maintaining the salinity trajectory associated with the 95 percent confidence bound until 2030 likely would result in a deceleration in the rate of salinization in the Sea. Any improvement over the Salton Sea Baseline likely would benefit piscivorous birds by extending the period of time that fish are supported in the Sea.

Avoiding salinity impacts also would result in the avoidance of biological impacts associated with changes in surface elevation. Because water surface elevation in the Sea under this strategy would be held at or above the Salton Sea Baseline projections, conservation-related changes in the use of nesting islands by covered species would not occur as a result of the Project. Likewise, potential impacts on the tamarisk scrub community adjacent to the Sea (e.g., shoreline strand) would not be affected by the Project prior to 2030 and might be avoided altogether. Implementation of this strategy also provides the ancillary benefit of allowing time for a Salton Sea restoration project to be developed.

***Salton Sea–2.*** *IID will ensure that an appropriate level of connectivity between pupfish populations within individual drains (at the north and south ends of the sea) that are connected to the Salton Sea either directly or indirectly and that are below the first check will be maintained in the event that conditions in the Salton Sea become unsuitable for pupfish during the term of the HCP. When the salinity of the Salton Sea reaches 90 ppt (or lower as determined by the HCP IT), IID will work with the HCP IT to prepare and implement a detailed plan for ensuring genetic interchange among the pupfish populations in the drains. IID will continue to maintain created pupfish habitats for the duration of the term of the permits. IID also will construct and maintain one pupfish refugium pond consistent with the "Desert Pupfish Recovery Plan." This pond will be maintained for the purpose of assisting in the recovery efforts for that species. IID will work with the HCP IT to determine the location, timing, and technique in implementing this measure.*

As previously described, desert pupfish occupy many of IID's drains that discharge directly to the sea. Similarly, many of CVWD's drains that discharge directly to the sea also support pupfish. Individual pupfish are believed to use shoreline pools and the Salton Sea to move among the various drains. As the sea becomes more saline and nears the limit of pupfish tolerance, movement among the drains could cease and isolate populations. Small, isolated populations are more susceptible to problems associated with reduced genetic variability and the effects of random environmental events. To avoid the potential for isolating pupfish populations in the drains, IID will work with the HCP IT to restore a connection between populations or otherwise ensure continued genetic exchange among populations. IID will ensure connectivity among drains at the north end of the sea and among drains at the south end of the sea but not between drains at the north and south ends of the sea. This would be accomplished by constructing new drain channels or rerouting channels to encourage confluence.

Pupfish have a high salinity tolerance, and have been recorded at a salinity of 90 ppt. Model results suggest that with implementation of Salton Sea–1, the 90 ppt level would not be reached

for at least 50 years. Given the time period between project initiation and when mitigation would be required, IID will defer the specifics of the mechanism by which connectivity will be achieved in order to take advantage of additional information that might be available at the time mitigation is necessary. When the salinity of the Salton Sea reaches 90 ppt (or lower as determined by the HCP IT), IID will work with the HCP IT to prepare a detailed plan for ensuring genetic interchange among the pupfish populations in the drains. The plan will be submitted to USFWS and CDFG for approval before implementation. The plan will include construction details, the schedule for completion, and a monitoring program to demonstrate effectiveness (including adaptive management elements if appropriate). The budget allocated for ensuring genetic interchange among populations in the drains will be based on the assumption that physical connections (channels) will be constructed and maintained. However, this should not preclude IID or the HCP IT from developing more suitable alternatives, which would need to be approved by the USFWS and CDFG.

In addition to ensuring connectivity among pupfish populations, IID will take a positive step to contribute to the recovery of desert pupfish by constructing and managing a refugium pond to support a population of pupfish consistent with the goals of the *Desert Pupfish Recovery Plan* (Marsh and Sada 1993). The pond will be designed and located in consultation with the HCP IT, USFWS, and CDFG. IID will develop a detailed plan in coordination with the HCP IT, and the USFWS and CDFG will have approval of the plan. The USFWS and CDFG will be responsible for identifying the source population. A person qualified to capture and handle pupfish and that meets the approval of CDFG and USFWS will make the introductions. Management of the pond will be carried out by IID, although IID may choose to transfer management to another entity (e.g., USFWS or CDFG). Any transfer of management responsibility would be accompanied by a management endowment to ensure continued management until the end of the term of the HCP.

***Salton Sea–3.*** *IID will conduct the following to address potential changes in tamarisk scrub habitat adjacent to the Salton Sea. Upon completion of the implementation of Salton Sea–1(i.e., 2030 or sooner), IID will conduct a survey of the areas designated as (1) "shoreline strand," (2) "adjacent wetland" with tamarisk as the primary vegetation as shown in the Salton Sea Digital Atlas (University of Redlands 1999), and (3) currently inundated areas that become exposed in the future by a reduction in water surface elevation of the Salton Sea. The general approach to the survey is described in Chapter 4. In consultation with the HCP IT, IID will develop the specific survey protocol necessary to establish the acreage in 2030 and to verify and quantify net changes in the total amount of tamarisk in shoreline strand and adjacent wetland areas in the future. The study plan will be submitted to USFWS and CDFG for approval.*

*If the survey conducted in 2030 (or sooner based on cessation of Salton Sea–1) shows no change or a net gain in the acreage of tamarisk relative to the 2,642 acres currently available, no mitigation will be required at that time. IID will repeat the survey every 5 years for the remainder of the permit term, but may choose to conduct the surveys more frequently. If the acreage of tamarisk scrub in shoreline strand, adjacent wetland, and currently inundated areas exposed in the future is found to be less than 2,642 acres at any time during the remainder of the permit, and the reduction can be reasonably attributable to the water conservation and transfer project, IID will mitigate the net loss (i.e., the difference between the acreage found in survey and 2,642 acres except as qualified below) by acquiring or creating native tree habitat as described below. IID will not be responsible for losses of tamarisk clearly caused by unrelated activities such as fire, or chemical or mechanical removal by a landowner other than IID. Under no circumstances will IID be required to mitigate losses of tamarisk scrub greater than 2,642 acres.*

*If necessary, IID will create or acquire native tree habitat consisting of mesquite bosque or cottonwood-willow habitat in amounts calculated based on the following ratios.*

- *If IID creates habitat prior to the surveys showing a net loss in the amount of tamarisk, the mitigation ratio for the acreage of created habitat to net lost acreage of tamarisk will be 0.25:1 as long as the created habitat meets the success criteria.*
- *If IID creates habitat after the surveys show a net loss or IID acquires existing habitat, the mitigation ratio for the acreage of the created or acquired habitat to lost acreage of tamarisk will be 0.75:1. The habitat will be created or acquired within 1 year of documenting a net reduction in tamarisk scrub unless otherwise agreed to by IID, USFWS, and CDFG.*
- *If IID elects to acquire habitat, IID will work with the HCP IT to identify a property for acquisition. Habitat to be acquired must support mesquite bosque or cottonwood-willow habitat and occur within the Salton Sea Basin. If the only available properties that meet these requirements are larger than required to compensate for the lost acreage, IID will acquire the least expensive property. IID can use the additional acreage of the acquired habitat to fulfill future mitigation obligations of Tree Habitat–1 or Tree Habitat–2. IID will place a conservation easement on acquired lands and provide for the property to be managed for covered species for the term of the permit. Within 1 year of recording the conservation easement, IID will prepare and submit to USFWS and CDFG for approval a management plan for the property that describes how the property will be managed. The management plan will describe the actions that IID will take to maintain the ecological functions of the acquired habitat. While the specific management needs will vary depending on the property acquired, considerations for the management plan include:*
  - *Measures to control human access (e.g., fencing, signage)*
  - *Frequency at which land will be visited to assess maintenance/management needs*
  - *Types of maintenance action (e.g., removing garbage, repairing fences)*
  - *Vegetation management practices (e.g., prescribed burning, removal of exotic plants)*

*With the approval of USFWS and CDFG, which approval shall not be unreasonably withheld, IID may transfer the land to a third party who agrees to and is authorized to manage the land for habitat conservation purposes. If IID transfers the land to a third party, IID will establish an endowment fund adequate to provide for the management of the lands for the term of the permit.*

*If IID elects to create habitat, IID will develop a habitat creation and management plan. The habitat creation and management plan will include the following information:*

- *Location*
- *Planting plan (including species composition and layout)*
- *Grading and other construction activities*
- *Long-term management practices*
- *Vegetation and species use monitoring*
- *Success criteria for the plantings and the actions that IID will take if the success criteria are not met*

*If a Salton Sea restoration project is implemented that affects the water surface elevation of the Sea prior to 2030, IID will not be required to conduct the surveys or mitigate any changes in the amount of tamarisk scrub adjacent to the Sea. If a Salton Sea restoration project is implemented following completion of Salton Sea – 1, IID will discontinue monitoring the shoreline strand and adjacent wetlands and will not be responsible for mitigating any additional reductions in the amount of tamarisk in these areas over the term of the permit. Further, in the event that mitigation water is allowed to flow to the Sea beyond 2030 (e.g., mitigation of air quality impacts), IID will not be required to conduct surveys or mitigate changes in the amount of tamarisk scrub adjacent to the Sea.*

The Salton Sea database identifies 293 acres of shoreline strand habitat along the Salton Sea. Shoreline strand habitat consists of tamarisk and iodine bush. In addition to the shoreline strand, the Salton Sea database identifies 2,349 acres of adjacent wetlands dominated by tamarisk. The source of the water that supports the shoreline strand community is uncertain but could consist of a combination of shallow groundwater and seepage from the Salton Sea. The extent to which the water surface elevation of the Salton Sea contributes to supporting this community is uncertain.

Depending on the relationship between the water surface elevation of the Salton Sea and maintenance of the shoreline strand and adjacent wetlands, the water conservation program could cause changes in the amount of tamarisk scrub habitat in shoreline strand and adjacent wetland areas once mitigation water is no longer supplied to the Sea (i.e., 2030). There is, however, considerable uncertainty about the extent of these possible changes. As the Sea recedes, tamarisk could establish at lower elevations, replacing habitat lost at high elevations. Alternatively, it has been suggested that tamarisk will not establish in areas exposed by a receding sea level because of excessive soil salinity (Reclamation and SSA 2000). In areas where drain water or shallow groundwater is the predominant water source, no change in tamarisk-dominated adjacent wetlands is expected. It is currently not possible to predict the magnitude of changes in tamarisk in shoreline strand and adjacent wetland areas.

Because of the uncertainty about the potential changes in the amount of tamarisk scrub adjacent to the Salton Sea, IID would monitor changes in this community and mitigate measured net losses in the amount of tamarisk reasonably attributable to the conservation and transfer of water. Within three years following the discontinued supply of mitigation water to the Sea (i.e., 2030), IID will conduct a field survey to determine areas typed as shoreline strand or adjacent wetland with tamarisk as the primary vegetation as shown in the Salton Sea Digital Atlas (University of Redlands 1999). The habitat boundaries will be determined, and the percent coverage by live tamarisk and dead tamarisk will be estimated. This information will establish the baseline and provide the basis for determining the extent of future changes in tamarisk scrub.

Potential impacts to the tamarisk scrub adjacent to the Salton Sea as a result of the covered activities would be associated with water conservation and transfer after 2030 and the resulting projected decline in the water surface elevation of the Salton Sea. Hydrologic modeling of the Proposed Project indicates that the water surface elevation would decrease at a slower rate than the Baseline prior to 2030, but decrease more rapidly than the Baseline after 2030 (see Figure 3.3-7).

IID will monitor the tamarisk scrub every 5 years after 2030 to identify reductions in tamarisk that occur as the plants adjust to the new sea elevation. It is important to note that the water surface elevation is projected to decline in the absence of the proposed water conservation and transfer programs as well. However, it will not be possible to differentiate changes in the adjacent wetland/shoreline strand community attributable to the conservation and transfer relative to the changes that would have occurred in the absence of the transfer. Nevertheless, IID has agreed to mitigate measured changes in the amount of tamarisk scrub that occur following 2030 in the delineated shoreline strand and adjacent wetland areas.

IID will continue to survey the adjacent wetland and shoreline strand areas every five years after completion of the baseline survey for the remainder of the HCP term. These data will be compared with the previous survey data to determine if there was a decline in the amount of tamarisk scrub habitat. In addition to evaluating changes in the shoreline strand and adjacent wetlands demarcated in the Salton Sea Digital Atlas (University of Redlands 1999), IID will review aerial photographs and conduct ground-truthing to determine if tamarisk scrub has colonized new areas in response to changes in sea elevation. The acreage of any new areas of tamarisk scrub will be determined. If the baseline acreage of tamarisk scrub established in 2030 is greater than the 2,642 acres currently available, IID would have no mitigation obligation. If the 2030 baseline acreage is less than 2,642, IID would be obligated to create or acquire and preserve native tree habitat to mitigate any take of covered species resulting from net loss of tamarisk scrub relative to the 2030 baseline levels. Net changes in the amount of tamarisk scrub would be identified in the surveys conducted subsequent to 2030. IID's mitigation responsibility would extend only to net losses reasonably attributable to reductions in Sea elevation and not to losses clearly caused by unrelated activities such as fire, or chemical or mechanical removal by a landowner other than IID. Under no circumstances would IID be required to mitigate a loss of more than 2,642 acres.

IID may mitigate net losses of tamarisk scrub in two ways: (1) acquire native tree habitat or (2) create native tree habitat. IID may elect to create native tree habitat prior to a reduction in tamarisk occurring. In this case, IID would be able establish functioning native tree habitat prior to any loss in tamarisk scrub. Native tree habitat has a higher value than tamarisk scrub. Based on the relative habitat values developed by Anderson and Ohmart (1984), the habitat value of native tree habitat is about four times greater than tamarisk. Thus, IID would replace tamarisk at a 0.25:1 ratio (native tree to tamarisk), if it creates native tree habitat prior to measuring a reduction in tamarisk in the shoreline strand or adjacent wetlands.

If IID acquires native tree habitat or creates native tree habitat after measuring a net loss, a higher mitigation ratio (0.75:1) will be used to determine the acreage of native tree habitat to acquire or create. In the case of acquiring habitat, a higher mitigation ratio is used because there would be a net loss of vegetation. A higher mitigation ratio also is used if habitat is created after the reduction has been measured to account for the delay between when the habitat is created and when it starts functioning as habitat.

IID will maintain or provide funding for the maintenance of created/acquired native tree habitat until the end of permit term. At the end of the permit, IID would either stop water conservation or continue with the water conservation and transfer program covered by this HCP. If IID continues with the water conservation and transfer program, then the impacts attributable to the water conservation and transfer program would continue. Compliance with FESA would need to be extended and likely would include continued maintenance of created/acquired native tree habitat to mitigate the impact associated with continuing the water conservation and transfer program. Alternatively, if IID terminated the water conservation and transfer project after 75 years, inflow from the IID Water Service Area to the Salton Sea would return to pre-project levels and therefore, the elevation of the Salton Sea would increase toward pre-project levels. To the extent that a decline in the sea elevation from the water conservation and transfer project caused a reduction in tamarisk scrub in adjacent

wetland areas, tamarisk would be expected to reestablish in these areas as the sea elevation increased. With the reestablishment of tamarisk after cessation of the water conservation and transfer project, continued maintenance of native tree habitat created or acquired under this measure would not be necessary to maintain habitat values for covered species. Therefore, it is not necessary to maintain native tree habitat that is created or acquired under this measure in perpetuity.

## 3.3.5 Effects on Covered Species

Covered species potentially using the Salton Sea in the HCP area include resident breeding species, migratory breeding species, short-term residents during winter or migration, and transient species that occur in the HCP area irregularly during migration or other wanderings. Under the Salton Sea Conservation Strategy, IID would conserve additional water and allow that water to flow to the Sea to address potential changes in fish resources. In addition, IID would implement specified measures to address potential effects to desert pupfish from increases in salinity and potential effects to species associated with tamarisk scrub from changes in tamarisk scrub habitat adjacent to the Salton Sea. The effects of implementing the HCP on covered species are evaluated below.

As part of the Monitoring and Adaptive Management Program (Chapter 4), IID could implement a survey or study program requiring capture of covered species. Capture of covered species constitutes take under both the federal and state ESAs. Take that occurs in association with surveys or studies conducted for this HCP is a covered activity and will be authorized under the state and federal ITPs. Any of the covered species could be taken through surveys or studies.

Studies and surveys conducted during the course of this HCP will be developed by IID in coordination with the HCP IT and will be subject to the approval of CDFG and USFWS prior to implementation. In approving the studies/surveys, the CDFG and USFWS will require capture methods that minimize the potential for death and injury of covered species. In addition, these agencies will specify the number of individuals of covered species that may be captured. Thus, the level of take authorized to occur through this mechanism will be specified on a case-by-case basis through the approval of the CDFG and USFWS.

### 3.3.5.1 White Pelican

The primary mechanism through which the covered activities could result in take of white pelicans is a reduction in fish abundance. As described in Section 3.3.2.1 the abundance of tilapia is expected to decrease as the salinity of the sea increases. With implementation of the Salton Sea Conservation Strategy, IID would avoid changes in salinity of the Salton Sea as a result of the water conservation and transfer programs. This approach is predicted to avoid impacts to white pelicans resulting from the acceleration of salinity increases and reduced fish abundance attributable to the water conservation and transfer programs. Under this strategy, fish would be expected to persist until about 2030 when the salinity of the sea is projected to exceed 60 ppt. The potential response of white pelicans to reduced fish availability at the Salton Sea after this salinity is exceeded is described in Section 3.3.2.1.

### 3.3.5.2 California Brown Pelican

The primary mechanism through which the covered activities could result in take of brown pelicans is a reduction in fish abundance. As described in Section 3.3.2.1 the abundance of

tilapia is expected to decrease as the salinity of the sea increases. Under the Salton Sea Conservation Strategy, IID would maintain the prey resource for brown pelicans until that resource would be lost without implementation of the water conservation and transfer program. Maintenance of the salinity below 60 ppt is predicted to avoid impacts to brown pelicans attributable to the water conservation and transfer programs. The potential response of brown pelicans to reduced fish availability at the Salton Sea after this point was described in Section 3.3.2.1.

### 3.3.5.3 Black Skimmer

The primary mechanism through which the covered activities could result in take of black skimmers is a reduction in fish abundance. As described in Section 3.3.2.1 the abundance of fish is expected to decrease as the salinity of the sea increases. Water conservation also could accelerate and increase the magnitude of the decline in the water surface elevation. With the accelerated drop in surface elevation, islands where black skimmers nest would become connected to the mainland earlier than under the baseline. Predation on eggs and chicks could be increased relative to the baseline during this period. Black skimmers could abandon nesting areas once they become accessible to land-based predators. The potential effects to black skimmers of changes in fish abundance and water surface elevation are described in more detail in Sections 3.3.2.1 and 3.3.2.2.

With implementation of the Salton Sea Conservation Strategy, changes in the salinity of the Salton Sea as a result of the water conservation and transfer programs are expected to be avoided. This approach would avoid impacts to black skimmers resulting from the acceleration of salinity increases and reduced fish abundance attributable to the water conservation and transfer programs. Under this strategy, fish would be expected to persist until about 2030 when the salinity of the sea is projected to exceed 60 ppt. This approach also would avoid the acceleration of surface elevation declines attributable to the water conservation and transfer programs. As a result, nesting and roosting islands would become connected to the mainland at about the same time as under the baseline after which nesting might not continue. The potential response of black skimmers to reduced fish availability at the Salton Sea after this salinity is exceeded was described in Section 3.3.2.1.

### 3.3.5.4 Van Rossem's Gull-Billed Tern

Gull-billed terns typically are associated with salt marshes and coastal bays, but also frequent open habitats such as pastures and farmlands for foraging. They primarily feed on insects, such as grasshoppers and beetles, but also will prey on earthworms, fish, frogs, lizards, small mammals, eggs, and young of other birds (CDFG 1999). Foraging likely occurs at the mudflats along the Sea as well as in adjacent agricultural fields and marshes. Potentially, a few gull-billed terns could be taken as a result of the accelerated decline in fish abundance. However, given their broad food habits and the availability of alternate foraging habitat, the potential reduction in tilapia abundance at the Salton Sea probably would not adversely affect the gull-billed tern population using the Salton Sea.

The Salton Sea is one of only two breeding locations for gull-billed terns in the United States, the other being in San Diego. About 160 pairs nest at the Sea each year (USFWS 1997b; Shuford et al. 1999). Numbers of nesting birds at the Salton Sea have declined from earlier estimates of about 500 as the rising sea has flooded nests (CDFG 1999). They nest on

sandy flats amidst shells and debris (CDFG 1999) around the south end of the Sea (Shuford et al. 1999). The largest breeding colonies are at the southeast corner of the Sea and to the south of Salton City (CDFG 1999) on Mullet Island and a small barren islet at Johnson Street. The islets at Rock Hill also support nesting gull-billed terns. The islets are in an impoundment of the Salton Sea NWR.

As explained in Section 3.3.2.2, nesting/roosting islands would become connected to the mainland with the reduction in the water surface elevation with and without implementation of the water conservation and transfer programs. Water conservation would accelerate and increase the magnitude of the decline in the water surface elevation relative to the baseline. With the accelerated drop in surface elevation, islands where gull-billed terns nest would become connected to the mainland a few years earlier than under the baseline. Predation on eggs and chicks could increase relative to the baseline during this period. Gull-billed terns could abandon some or all of their current nesting areas once they become accessible to land-based predators. Under the Salton Sea Conservation Strategy, the nesting/roosting islands would become connected to the mainland at about the same time as under the baseline condition, thus potential impacts would be avoided.

#### 3.3.5.5 Double-Crested Cormorant

At the Salton Sea, cormorants nest on rocky ledges on Mullet Island or on dead vegetation at the deltas of the New and Alamo rivers. Snags in the Salton Sea are important for providing protected roost sites for double-crested cormorants. Cormorants regularly move between the Salton Sea and the lakes at the Finney-Ramer Unit of the Imperial WA where they forage. The Finney-Ramer Unit of the Imperial WA also supports nesting and roosting double-crested cormorants at the lakes on this unit.

Double-crested cormorants are a common and abundant species at Salton Sea, with counts of up to 10,000 individuals (IID 1994). Small nesting colonies were documented at the north end of the Sea in 1995 (USFWS 1996), but recently (1999) over 7,000 double-crested cormorants and 4,500 nests were counted on Mullet Island. Mullet Island currently supports the largest breeding colony of double-crested cormorants in California (Shuford et al. 1999).

The covered activities could result in take of double-crested cormorants through two mechanisms. First, the covered activities could result in take of cormorants through a reduction in fish abundance. As described in Section 3.3.2.1 the abundance of fish is expected to decrease as the salinity of the sea increases. Water conservation to implement the water conservation and transfer programs could increase the rate of salinization of the sea and concomitantly accelerate the decline in fish abundance. Survival of adults or chicks could be reduced as prey availability declines at the Salton Sea.

Water conservation also could accelerate and increase the magnitude of the decline in the water surface elevation. With the accelerated drop in surface elevation, snags and islands where double-crested cormorants nest would become connected to the mainland a few years earlier than under the baseline. Predation on eggs and chicks could be increased relative to the baseline during this period. Double-crested cormorants could abandon nesting areas once they become accessible to land-based predators.

The population of double-crested cormorants in the United States declined considerably during the 1960s and early 1970s. This decline was attributed to pesticide residues in the

marine food chain, principally DDT (Small 1994). The population began recovering in the late 1970s and 1980s, and is currently estimated to number 1 to 2 million birds in the United States and Canada with the U.S. population increasing at a rate of about 6 percent (*64 Federal Register* [*FR*] 60826). In some locations, cormorant populations have increased to levels that some consider them a significant competitor with recreational fishing. In response, the USFWS is developing a national double-crested cormorant management plan (*64 FR* 608266).

Double-crested cormorants are abundant throughout California and the United States. With the large and increasing population throughout the United States and Canada, even complete loss of cormorants breeding at the Salton Sea would not jeopardize or substantially reduce the United States population of cormorants, despite the Sea harboring the largest breeding colony in California. Thus, even if some individuals were lost as a result of the covered activities, the effects on the entire cormorant population would be minor.

Under the Salton Sea Conservation Strategy, impacts to fish-eating birds, including double-crested cormorants are predicted to be avoided by avoiding changes in the salinity of the Salton Sea attributable to the water conservation and transfer program. IID would supply sufficient water to the sea to offset the salinity increases attributable to water conservation and transfer. This is predicted to avoid accelerating salinization of the sea and the earlier occurrence of expected declines in fish abundance. Under the baseline condition, the salinity of the Salton Sea is projected to exceed 60 ppt, the threshold above which reproduction of tilapia is expected to decline, in 2030. The potential response of double-crested cormorants to reduced fish availability at the Salton Sea after the threshold is reached was described in Section 3.3.2.1.

Provision of mitigation water to the Salton Sea also would avoid impacts to nesting sites used by cormorants and potentially provide a beneficial effect. As shown in Figure 3.3-7, the surface elevation of the Sea would be higher than under the baseline from about 2009 until 2035. Mullet Island where the largest colony of double-crested cormorants occurs at the Salton Sea is separated from the mainland by about 4 feet of water. Under the baseline, the surface elevation of the Sea would fall 4 feet by 2015. With implementation of Salton Sea–1, this degree of elevation drop would not occur until 2026, thereby retaining the separation of Mullet Island from the mainland for 11 more years.

#### 3.3.5.6 Western Snowy Plover

Western snowy plovers are year-round breeding residents and winter migrants at the Salton Sea. The Salton Sea supports the largest wintering population of snowy plovers in the interior western United States and one of only a few key breeding populations in interior California (Shuford et al. 1999). The summer breeding population typically consists of over 200 individuals (IID 1994).

Nesting habitat for the western snowy plover in the project area is limited to the shoreline of the Salton Sea where they are known to nest on undisturbed, flat, sandy or gravelly beaches (Reclamation and SSA 2000). For foraging, snowy plovers use the shoreline of the Salton Sea, primarily concentrated on sandy beaches or alkali flats along the western and southern shorelines. They also could forage in agricultural fields in the valley.

Use of the Salton Sea by western snowy plovers is not expected to change substantially as a result of the covered activities, including implementation of the water conservation and

transfer project. This species forages for insect prey on mudflats, and nests in similar habitats. Mudflat habitats would continue to exist with a decline in Sea elevation, thus, continuing to provide nesting and foraging opportunities for western snowy plover.

Under the Salton Sea Conservation Strategy, IID would conserve additional water and allow this water to flow to the Salton Sea until 2030 such that there would be no change in salinity of the Salton Sea from implementation of the water conservation and transfer programs. Fallowing could be used to generate this water which could reduce foraging opportunities for snowy plover by reducing the amount of agricultural land in production. Take of snowy plovers could result from reductions in agricultural fields; this potential effect is evaluated in Section 3.8.6.9.

### 3.3.5.7 Osprey

Ospreys occur at the Salton Sea in small numbers as a nonbreeding visitor throughout the year (IID 1994). They prey almost exclusively on fish. Large trees and snags near the water are used for roosting and nesting. In the HCP area, suitable habitat conditions exist for the osprey at the Salton Sea and other water bodies in the HCP area including Fig Lagoon, the New and Alamo rivers, and Finney and Ramer lakes.

The primary mechanism through which the covered activities could result in take of osprey is a reduction in fish abundance. As described in Section 3.3.2.1 the abundance of tilapia is expected to decrease as the salinity of sea increases. Water conservation to implement the water conservation and transfer programs could increase the rate of salinization of the sea and accelerate the decline in fish abundance. Potentially a few individual ospreys could be taken as a result of reduced foraging opportunities in the HCP area.

Under the Salton Sea Conservation Strategy, IID would implement measures to maintain fish at the Salton Sea on which osprey could prey until that resource would be lost without implementation of the water conservation and transfer program. This measure would offset take of osprey that could result from the accelerate decline in fish in the Sea. In addition, foraging opportunities for osprey would continue to be available at other locations in the HCP area. Because only a small number of ospreys currently use the HCP area, these other foraging locations likely would be adequate to support the existing level of use of the HCP area by ospreys. With the small numbers of ospreys that use the HCP area and the minimal potential for take to occur, implementation of the HCP would not jeopardize the continued existence of the species.

### 3.3.5.8 Black Tern

Black terns are common at the Salton Sea during the spring, summer and fall; they rarely occur at the Sea during the winter (USFWS 1997b). The Salton Sea watershed is thought to be the most important staging area for black terns in the Pacific Flyway (Shuford et al. 1999). In addition to the Salton Sea, black terns are common summer residents and migrants in Imperial Valley with up to about 10,000 individuals foraging over agricultural fields at some times (Shuford et al. (1999). There is no evidence that nesting occurs in the HCP area (CDFG 1999) although nesting could be supported in future.

Black terns forage primarily on insects and fish, but tadpoles, frogs, spiders, earthworms, and crustaceans are also taken. While black terns foraging in agricultural fields are assumed

to be foraging on insects, those at the Salton Sea could forage on insect prey as well as fish. The relative importance of these different prey types to black terns at the Salton Sea has not been determined.

Water conservation to implement the water conservation and transfer programs could increase the rate of salinization of the sea and accelerate the decline in fish abundance at the Salton Sea. Potentially a few individual black terns could be taken as a result of reduced foraging opportunities in the HCP area. Under the Salton Sea Conservation Strategy, IID would implement measures to maintain fish at the Salton Sea until that resource would be lost without implementation of the water conservation and transfer program. This approach would avoid impacts to black tern resulting from accelerated declines in fish abundance. However, if fallowing is used to generate water for mitigation, the reduction of agricultural land in production could reduce foraging opportunities for black terns. The effect of the potential take of black terns resulting from reductions in agricultural fields is evaluated in Section 3.8.6.10.

Black terns eat a wide variety of prey and forage in a variety of habitats. As a result, foraging opportunities will continue to be available in the HCP area and the potential for take is low. The Salton Sea, Drain Habitat, and Agricultural Field Habitat conservation strategies will contribute to maintaining foraging opportunities for black tern in the HCP area. The Salton Sea Conservation Strategy will avoid changes in fish abundance attributable to the water conservation and transfer programs. Under the Drain Habitat Conservation Strategy, 190 to 652 acres of managed marsh will be created and the Agricultural Field Habitat Conservation Strategy will enhance the probability that agricultural will remain the predominant land use in the HCP area. In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.3.5.9 Laughing Gull

Laughing gulls are a common post-breeding visitor (up to 1,000 individuals) at the Salton Sea and nested in the area up until the 1950s (USFWS 1997b; IID 1994; Shuford et al. 1999). They previously nested on sandy islets along the southwestern shore of the Salton Sea. Nesting habitat on the islets was lost to erosion as the Sea elevation increase and could have caused laughing gulls to abandon nesting at the Salton Sea. Currently, most laughing gulls occur at the south end of the Sea and in adjacent marsh habitats on the state and federal refuges.

The primary mechanism through which the covered activities could result in take of laughing gulls is a reduction in fish abundance. As described in Section 3.3.2.1 the abundance of tilapia is expected to decrease as the salinity of sea increases. Water conservation for the water conservation and transfer programs could increase the rate of salinization of the sea and concomitantly accelerate the decline in fish abundance. Potentially a few laughing gulls could be taken as a result of reduced foraging opportunities at the Salton Sea. Under the Salton Sea Conservation Strategy, IID would implement measures to maintain fish at the Salton Sea until that resource would be lost without implementation of the water conservation and transfer program. This would avoid or offset impacts to laughing gull resulting from accelerated declines in fish abundance.

### 3.3.5.10 Wood Stork

Wood storks have a limited distribution in the United States, breeding only in Florida. Wood storks do not breed at the Salton Sea but use the area as a post-breeding visitor. Storks using the Salton Sea probably come from breeding colonies in Mexico. They can arrive at the Salton Sea as early as May after the breeding season and remain as late as October (Small 1994). At the Salton Sea, as many as 1,500 wood storks were counted in the 1950s (Shuford et al. 1999), but more recently counts of only 275 have been reported (IID 1994).

Wood storks forage in shallow water for small fish, small vertebrates and aquatic invertebrates. At the Salton Sea, shallow shoreline areas and pools formed by barnacle bars provide appropriate foraging conditions for wood storks. They also forage in freshwater impoundments on the refuges adjacent to the sea. Most wood storks at the Salton Sea occur at the southern end (CDFG 1999).

The effects of the water conservation and transfer project on wood storks would be similar to that described for laughing gulls, black terns and gull-billed terns with respect to changes in food resources. As described for these species, a few wood storks could be taken as a result of reduced foraging opportunities in the HCP area. Under the Salton Sea Conservation Strategy, IID would implement measures to maintain fish at the Salton Sea until that resource would be lost without implementation of the water conservation and transfer program. Depending on its location and characteristics, managed marsh created under the Drain Habitat Conservation Strategy could increase foraging opportunities for wood storks by supporting a variety of vertebrate and invertebrate prey species. The Salton Sea and Drain Habitat conservation strategies would avoid impacts to wood stork from changes in foraging opportunities at the Salton Sea; therefore, implementation of the HCP would not jeopardize the continued existence of wood stork.

### 3.3.5.11 Long-Billed Curlew

The long-billed curlew is a common, year round resident in the HCP area, with a large wintering population (Shuford et al. 2000). The number of birds in the Imperial Valley and at the Salton Sea varies throughout the year. Shuford et al. (2000) reported a total of 5,593 individuals in December 1999 during a survey for mountain plover that covered about 60 percent of the Imperial Valley. The highest count of long-billed curlews in the HCP area was nearly 7,500 birds in August 1995 (Shuford et al. 1999). Long-billed curlews are not known to breed in the HCP area (Shuford et al. 1999).

Long-billed curlews forage on a variety of insect prey, including beetles, grasshoppers, and spiders. In coastal areas, it also feeds on crabs, crayfish, mollusks, and other large invertebrates. With these food habitats, long-billed curlews could forage along the shoreline of the Salton Sea but commonly forage in agricultural fields.

The covered activities, including implementation of the water conservation and transfer project are not expected to substantially affect use of the HCP area by long-billed curlew. Mudflats at the Salton Sea that long-billed curlews could use for foraging would continue to be available and abundant even at reduced Sea elevations. Take of long-billed curlew could result from reductions in agricultural fields even though agricultural fields that long-billed curlews frequent for foraging would remain abundant. The degree of reduction in

agricultural fields would depend in part on the extent to which fallowing is used to conserve water. Effects to long-billed curlew from changes in agricultural fields are evaluated in Section 3.8.6.15.

### 3.3.5.12 California Least Tern

The California least tern occurs at the Salton Sea only accidentally. Fewer than 10 records of this species exist at the Salton Sea NWR (USFWS 1997b). Nesting has not been reported. Given the very low level of use of the HCP area, it is very unlikely that the covered activities would result in take of any California least terns. However, an individual potentially could be taken as a result of reduced foraging opportunities at the Salton Sea because of the accelerated reduction in fish abundance. Under the Salton Sea Conservation Strategy, IID would implement measures to maintain fish at the Salton Sea as potential forage base for California least tern until that resource would be lost without implementation of the water conservation and transfer program. The predicted avoidance of changes in fish abundance attributable to the water conservation and transfer program with implementation of the Salton Sea Conservation Strategy would offset the minimal amount of take of California least tern that could occur. Therefore, implementation of the HCP would not jeopardize the continued existence of least tern.

### 3.3.5.13 Bald Eagle

Bald eagles are a rare and occasional winter visitor to the Salton Sea with one to three individuals typically observed during winter. When visiting the Salton Sea, bald eagles probably prey on the abundant fish but probably also pursue waterfowl at the Sea or managed marshes in the Imperial Valley.

The primary mechanism through which the covered activities could result in take of bald eagle at the Salton Sea is a reduction in fish abundance. As described in Section 3.3.2.1 the abundance of tilapia is expected to decrease as the salinity of sea increases. Water conservation to implement the water conservation and transfer programs is projected to increase the rate of salinization of the sea and accelerate the decline in fish abundance at the Salton Sea. A few bald eagles potentially could be taken as a result of reduced foraging opportunities.

Under the Salton Sea Conservation Strategy, IID would implement measures to maintain fish at the Salton Sea until that resource would be lost without implementation of the water conservation and transfer program. The Salton Sea Conservation Strategy would avoid impacts to bald eagles from changes in foraging opportunities at the Salton Sea; therefore, implementation of the HCP would not jeopardize the continued existence of bald eagles.

### 3.3.5.14 Bank Swallow

Bank swallows are casual visitors to the HCP area, potentially occurring in the HCP area as migrants during the spring and fall. For foraging, they are not strongly associated with any particular habitat type, although they often forage near water where insects are abundant. Insects would continue to be available at the Salton Sea and adjacent marsh habitats. To the extent that bank swallows currently forage along the Salton Sea, foraging opportunities would persist with no impacts to bank swallows anticipated as a result of changes at the sea.

Bank swallows could be taken by covered activities that affect tamarisk scrub habitat and agricultural habitat as discussed in Sections 3.5.6.7 and 3.8.6.4.

### 3.3.5.15 Elegant Tern

Elegant terns occur only accidentally at the Salton Sea during spring. In the HCP area, elegant terns would be expected to occur only at the Salton Sea where they would forage on fish. Given the very low level of use of the HCP area, it is very unlikely that the covered activities would result in take of any elegant terns. However, an individual could be taken as a result of reduced foraging opportunities in the HCP because of the accelerated reduction in fish abundance.

Under the Salton Sea Conservation Strategy, IID would implement measures to maintain fish at the Salton Sea until that resource would be lost without implementation of the water conservation and transfer program. By avoiding changes in fish abundance, implementation of the Salton Sea Conservation Strategy would avoid or minimize the impact of any take of elegant terns.

### 3.3.5.16 Reddish Egret

The reddish egret is a rare visitor to the HCP area in the summer and fall. They are mainly expected to occur at the Salton Sea where suitable foraging habitat exists along the margins of the Salton Sea. Marsh habitats adjacent to the Salton Sea also could provide suitable foraging conditions for this species.

The effects of the water conservation and transfer project on reddish egrets would be similar to that described for laughing gulls, black terns and gull-billed terns with respect to changes in food resources. As described for these species, a few reddish egrets could be taken as a result of reduced foraging opportunities in the HCP area. Under the Salton Sea Conservation Strategy, IID would implement measures to maintain fish at the Salton Sea until that resource would be lost without implementation of the water conservation and transfer program. By avoiding changes in fish abundance, implementation of the Salton Sea Conservation Strategy would avoid or minimize the impact of any take of reddish egret.

### 3.3.5.17 Merlin

Merlins are rare visitors to the HCP area in the fall and winter (USFWS, 1997b). They are not known to nest in the area; therefore, use of the HCP area is limited to foraging. Merlins forage for shorebirds and other small birds in open habitats. With the exception of desert habitat, all of the habitats in the HCP area could be used by foraging merlins to varying degrees. The covered activities are unlikely to adversely affect merlins because of their very rare occurrence in the HCP area and broad habitat use for foraging. However, a few individuals could be taken because of changes in foraging habitat availability or quality potentially resulting from permanent or temporary reductions in drain vegetation (See Section 3.5.2.2), permanent or temporary reductions in tamarisk scrub habitat (See Section 3.4.2), or changes in the composition and amount of agricultural field habitat (See Section 3.8.2). Although the ecology of the Salton Sea will change as the salinity of the sea increases, shorebirds would be expected to continue to use the sea and adjacent habitats and provide foraging opportunities for merlins.

The minimal amount of potential take would be mitigated by implementation of the Salton Sea, Tamarisk Scrub Habitat, Drain Habitat, and Agricultural Field Habitat conservation strategies. Loss of tamarisk scrub habitat at the Salton Sea and in the Imperial Valley would be offset through the creation/acquisition and long-term protection of native tree habitat (See Sections 3.3.4.2 and 3.4.5). By attracting a variety of songbirds, native tree habitat would provide higher quality foraging opportunities for merlins. The Drain Habitat Conservation Strategy also would contribute to mitigating the impact of any take of merlin that could occur by increasing foraging opportunities through creation of managed marsh habitat. Finally, the Agricultural Field Habitat Conservation Strategy (See Section 3.8.4) would enhance the likelihood that agriculture would remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for merlins. In combination, these strategies would mitigate the minimal amount of take of merlin potentially occurring and would not jeopardize the continued existence of the species.

### 3.3.5.18 Black Swift

Black swifts occur accidentally in the HCP area during the spring. Only two records of this species exist for the Salton Sea NWR (USFWS, 1997b). Black swift forage for insects in open habitats. For foraging, they are not strongly associated with any particular habitat type, although they often forage near water where insects are abundant. The covered activities are unlikely to adversely affect black swift because of the swift's very rare occurrence in the HCP area and broad habitat use for foraging. However, a few individuals could be taken because of changes in foraging habitat availability or quality potentially resulting from permanent or temporary reductions in drain vegetation (See Section 3.5.2.2), permanent or temporary reductions in tamarisk scrub habitat (See Section 3.4.2), or changes in the composition and amount of agricultural field habitat (See Section 3.8.2). Although the ecology of the Salton Sea will change as the salinity of the sea increases, insects would be expected to continue to be available at the sea and adjacent habitats and provide foraging opportunities for black swift.

The minimal amount of potential take would be mitigated by implementation of the Salton Sea, Tamarisk Scrub Habitat, Drain Habitat, and Agricultural Field Habitat conservation strategies. Loss of tamarisk scrub habitat at the Salton Sea and in the Imperial Valley would be avoided or offset through the creation/acquisition and long-term protection of native tree habitat (See Sections 3.3.4.2 and 3.4.5). By supporting more abundance and diverse insect populations than tamarisk scrub, native tree habitat would provide higher quality foraging opportunities for black swift. The Drain Habitat Conservation Strategy also would contribute to mitigating the impact of any take of black swifts that could occur by increasing foraging opportunities through creation of managed marsh habitat. Finally, the Agricultural Field Habitat Conservation Strategy (See Section 3.8.4) would enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for black swift. In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.3.5.19 Vaux's Swift

Vaux's swifts occur in the HCP area as a migrant during the spring and fall. It is relatively common at the Salton Sea during the spring but considered uncommon in the fall (USFWS

1997b). Thousands of migrating birds have been reported at the north end of the Salton Sea during the spring but are relatively uncommon elsewhere in the Salton Basin during spring migration (Garrett and Dunn, 1981). For foraging, they are not strongly associated with any particular habitat type, although they often forage near water where insects are abundant.

The covered activities are unlikely to adversely affect Vaux's swift because of the swift's brief occurrence in the HCP area and broad habitat use for foraging. However, a few individuals could be taken because of changes in foraging habitat availability or quality potentially resulting from permanent or temporary reductions in drain vegetation (See Section 3.5.2.2), permanent or temporary reductions in tamarisk scrub habitat (See Section 3.4.2), or changes in the composition and amount of agricultural field habitat (See Section 3.8.2). Although the ecology of the Salton Sea will change as the salinity of the sea increases, insects would remain available at the sea and in other habitats throughout the HCP area.

The minimal amount of potential take would be mitigated by implementation of the Salton Sea, Tamarisk Scrub Habitat, Drain Habitat, and Agricultural Field Habitat conservation strategies. Loss of tamarisk scrub habitat at the Salton Sea and in the Imperial Valley would be avoided or offset through the creation/acquisition and long-term protection of native tree habitat (See Sections 3.3.4.2 and 3.4.5). By supporting more abundant and diverse insect populations than tamarisk scrub, native tree habitat would provide higher quality foraging opportunities for Vaux's swift. The Drain Habitat Conservation Strategy also would contribute to mitigating the impact of any take of Vaux's swift that could occur by increasing foraging opportunities through creation of managed marsh habitat. Finally, the Agricultural Field Habitat Conservation Strategy (see section 3.8.4) would enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for Vaux's swift. In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.3.5.20 Purple Martin

Purple martins are occasional visitors to the Salton Sea area as spring and fall migrants (USFWS, 1997b). No published records exist of purple martins nesting in the southeastern portion of California (Williams, 1996), and purple martins are not expected to nest in the HCP area. For foraging, they are not strongly associated with any particular habitat type, although they often forage near water where insects are abundant. However, a few individuals could be taken because of changes in foraging habitat availability or quality potentially resulting from permanent or temporary reductions in drain vegetation (See Section 3.5.2.2), permanent or temporary reductions in tamarisk scrub habitat (See Section 3.4.2), or changes in the composition and amount of agricultural field habitat (See Section 3.8.2). Although the ecology of the Salton Sea will change as the salinity of the sea increases, insects would be expected to continue to be available at the sea and adjacent habitats and provide foraging opportunities for purple martin.

The minimal amount of potential take would be mitigated by implementation of the Salton Sea, Tamarisk Scrub Habitat, Drain Habitat, and Agricultural Field Habitat conservation strategies. Loss of tamarisk scrub habitat at the Salton Sea and in the Imperial Valley would be avoided or offset through the creation/acquisition and long-term protection of native tree habitat (See Sections 3.3.4.2 and 3.4.5). By supporting more abundant and diverse insect

populations than tamarisk scrub, native tree habitat would provide higher quality foraging opportunities for purple martin. The Drain Habitat Conservation Strategy also would contribute mitigating the impact of any take of purple martin that could occur by increasing foraging opportunities through creation of managed marsh habitat. Finally, the Agricultural Field Habitat Conservation Strategy (See Section 3.8.4) would enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for purple martin. In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

# 3.4 Tamarisk Scrub Habitat Conservation Strategy

## 3.4.1 Amount and Quality of Habitat in the HCP Area

In the HCP area, tamarisk scrub is found along the New and Alamo rivers, sporadically along some drains, in seepage areas adjacent to the East Highline Canal and All American Canal (AAC), adjacent to the Salton Sea, and in other scattered and isolated patches throughout the HCP area wherever water is available. The covered species associated with tamarisk scrub habitat (Table 2.3-16) primarily are riparian species that find optimal habitat in riparian vegetation consisting of mesquite, cottonwoods, willows, and other native riparian plant species. Tamarisk has invaded most areas within the HCP area where water supplied from the Colorado River provides sufficient soil moisture. Native riparian or mesquite bosque habitat is largely absent from the HCP area. Tamarisk also has colonized non-riparian areas along drains or seepage areas. Tamarisk scrub habitat is not optimal habitat for the species that use this habitat in the HCP area. Rather, it constitutes the only available tree-dominated habitat in the HCP area. While covered species will use tamarisk scrub, it is poor quality habitat and is not preferred.

The New and Alamo rivers support about 2,568 acres and 962 acres of tamarisk scrub habitat respectively, for a total of 3,530 acres. About 31 acres occur in the deltas of these rivers. With its tolerance for high salt concentrations, tamarisk has colonized the margins of the Salton Sea. Tamarisk is a primary component of areas designated as shoreline strand community in the Salton Sea database. The shoreline strand community occurs immediately adjacent to the sea and consists of tamarisk and iodine bush and encompasses about 293 acres (University of Redlands 1999). The source of the water that supports the shoreline strand community is uncertain, but is likely the result of shallow groundwater and seepage rising to the surface at its interface with the Salton Sea. In addition to the shoreline strand community, tamarisk scrub occupies about 2,349 acres of adjacent wetland areas of the Salton Sea as designated in the Salton Sea database. Section 2.3.2 provides additional information on the location and characteristics of the shoreline strand and adjacent wetland areas. Tamarisk is a common species in the drains. Drains support an estimated 215 acres of tamarisk scrub habitat. About 412 acres and 755 acres of tamarisk scrub habitat also are supported in seepage areas adjacent to the East Highline Canal and AAC, respectively. Table 3.4-1 summarizes the location and acreage of tamarisk scrub in the HCP area.

**TABLE 3.4-1**
Location and Acreage of Tamarisk Scrub Habitat in the IID HCP Area

| Location | Acreage |
|---|---|
| New River | 2,568 |
| Alamo River | 962 |
| Shoreline strand | 293 |
| Adjacent to Salton Sea | 2,349 |
| Drains | 215 |
| AAC Seepage area | 755 |
| East Highline Canal seepage areas | 412 |
| Other patches | Unquantified |
| **Total Quantified** | **7,554** |

## 3.4.2 Effects of the Covered Activities

The mechanisms through which the covered activities could take a covered species associated with tamarisk scrub are changes in habitat (permanent or temporary changes), disturbance, or mortality/injury. The potential effects of each of the covered activities on tamarisk scrub vegetation and covered species using tamarisk scrub habitat is described in Table 3.4-2. Activities with the potential to affect habitat are described in more detail following the table. Activities that are not expected to affect habitat have a very limited potential to affect covered species, with potential effects limited to disturbance in the event that the activity was conducted in proximity to tamarisk scrub inhabited by covered species.

**TABLE 3.4-2**
Potential Effects of Covered Activities on Covered Species Associated With Tamarisk Scrub Habitat

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| **Water Use and Conservation** | |
| Combined effects of on-farm and system-based water conservation | Water conservation could reduce the amount of water flowing to the Salton Sea and contribute to a reduced sea elevation. The acreage of tamarisk scrub in areas adjacent to the Salton Sea could be reduced. This potential effect is addressed as part of the Salton Sea Habitat Conservation Strategy (See Salton Sea–3 in Section 3.3.4.2). |
| Installation of on-farm water conservation features | On-farm water conservation practices would be constructed within agricultural fields or their margins and therefore would not likely affect tamarisk scrub habitat or covered species using tamarisk scrub habitat. Tamarisk could colonize the margins of constructed tailwater return ponds and delivery ponds and thereby increase the availability of this habitat to covered species. |
| **Installation of System-Based Water Conservation Features** | |
| Canal lining and piping | Canal lining is proposed along 1.74 miles of canal to reduce seepage. Canals proposed for lining (see Section 1.7) are surrounded by agricultural fields. Tamarisk does not occur along the canals proposed for lining because IID tightly controls vegetation within the canal right-of-way and farming adjacent to the canals prevent the development of tamarisk outside of IID's right-of-way. |
| Construction of new canals | New canals would be constructed through agricultural fields and would tie into the existing canal system. Only if a new canal crossed a drain in an area supporting tamarisk scrub would there be the potential for impacts to species associated with tamarisk scrub. It is anticipated that construction of new canals would not affect tamarisk scrub habitat or covered species using this habitat to any meaningful level because little additional canal would be constructed over the term of the permit and |

**TABLE 3.4-2**
Potential Effects of Covered Activities on Covered Species Associated With Tamarisk Scrub Habitat

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| | effects to tamarisk scrub habitat would only occur if the new canal crossed a drain in an area supporting tamarisk. |
| Lateral interceptors | Lateral interceptors would be constructed in agricultural fields but would cross some drains where there could be tamarisk scrub. As described under Structure Maintenance below, IID anticipates constructing up to six drain crossings each year. Drain crossings for lateral interceptors are encompassed by those described under Structure Maintenance.<br><br>A lateral interceptor system includes a small reservoir (see Section 1.7). Construction of the reservoirs could remove up to 15 acres of tamarisk scrub vegetation. |
| Reservoirs | IID could construct up to 100 reservoirs 1 to 10 acres in size, and encompassing up to 1,000 acres. These reservoirs would be on agricultural lands or barren lands and would not impact tamarisk scrub habitat.<br><br>Farmers are expected to construct 1 to 2 acre reservoirs to better regulate irrigation water. These reservoirs would be installed in agricultural fields and would not impact tamarisk scrub habitat. |
| Seepage Recovery Systems | Seepage recovery systems are proposed along the East Highline Canal. About 43 acres of tamarisk scrub habitat could be permanently lost because of installation of subsurface seepage recovery systems. Effects of surface seepage recovery systems on vegetation are addressed under the Drain Habitat Conservation Strategy (Section 3.5.4). |
| **Operation and Maintenance** | |
| Conveyance system operation | Conveyance system operation is limited to moving water through the canals to meet customer needs and to address maintenance requirements. Other than the filling, draining and moving water through the canals, no physical effects are encompassed by conveyance system operation. No effects to tamarisk or covered species using tamarisk scrub habitat would be expected. |
| **Drainage System Operation** | |
| Rerouting or constructing new drains | IID reroutes or constructs about 2 miles of drains every 10 years. Newly constructed drains could increase habitat for covered species associated with tamarisk scrub habitat. If IID constructed 2 miles of drains every 10 years, 15 miles of new drains would be created over the 75-year permit term, which could increase habitat for species associated with tamarisk scrub habitat as tamarisk colonized the new drain.<br><br>Rerouting drains could result in the temporary reduction in vegetation in the drains during the period between abandonment of the old drain and when vegetation develops in the rerouted drain. No net loss of vegetation would occur because the rerouted portion would replace the abandoned section. |
| Piping drains | Over the 75-year term IID anticipates that about 50 miles of open drains would be pipelined, with an annual average of 0.67 miles of drain pipelining. About 22 acres of vegetation in the drains could be lost over the term of the permit of which an estimated 7 acres could be tamarisk. |
| Inspection activities | Potential effects of inspection activities would be limited to a minor potential for disturbance of covered species if they occur in the vicinity of structures at the time of inspection. |
| Canal lining maintenance | Canal lining maintenance consists of repairing the concrete lining of canals only. Activities required for canal lining maintenance are limited to |

**TABLE 3.4-2**
Potential Effects of Covered Activities on Covered Species Associated With Tamarisk Scrub Habitat

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| | the canal prism and adjacent roadway. Tamarisk does not grow in these areas. Therefore, canal lining maintenance would not likely affect tamarisk scrub habitat or covered species using this habitat. |
| Right-of-way maintenance<br>Embankment maintenance<br>Erosion maintenance | Along drains, right-of-way maintenance, embankment maintenance and erosion maintenance is conducted in association with vegetation control/sediment removal along drains. Potential impacts to covered species from these activities are encompassed by those under vegetation control.<br><br>Along canals, these activities consist of grading and grooming canal embankments and maintaining the right-of-way free of vegetation. Vegetation typically consists of *Atriplex* and arrowweed but can include tamarisk. All canals are treated annually. Because of this annual treatment, tamarisk cannot become established and develop enough to provide habitat for covered species.<br><br>Occasionally, storm events will cause bank sloughing or wash outs along drains and require immediate repair. The bank sloughing or wash outs remove vegetation (e.g., tamarisk) such that IID's actions to correct the erosion problem require minimal additional vegetation removal, including removal of tamarisk. |
| Seepage maintenance | Seepage maintenance is conducted only along the canal system and consists of repairing leaks. Because seepage maintenance is done regularly and routinely, tamarisk does not become established. Therefore, seepage maintenance would not likely affect tamarisk habitat or covered species using this habitat. |
| Structure maintenance | IID estimates that about 300 structures will be replaced each year. About 100 of these structures would be drainage structures with the remaining 200 canal structures. Replacement of canal structures would not be expected to affect tamarisk scrub habitat. All construction activity would be conducted with the canal's right-of-way that is maintained free of vegetation.<br><br>Along lateral drains, replacing each structure temporarily disturbs an area about 75 feet long. Thus, each year about 7,500 feet (1.4 miles) of the drains would be disturbed, potentially and temporarily removing 0.6 acres of vegetation, a portion of which could be tamarisk ([7500 ft X 14 ft / 43560]*26 percent vegetated). This potential loss of vegetation is addressed in the Drain Habitat Conservation Strategy (Section 3.5.4).<br><br>Installation of new drain crossings could result in the permanent loss of drain vegetation. IID estimates that six 40-foot-wide crossings will be constructed each year. Based on this estimate, 18,000 feet (3.4 miles) of drain would be affected by drain crossings over the term of the permit, potentially resulting in the loss of 1.5 acres of drain vegetation, a portion of which could be tamarisk. ([18,000 ft X 14 ft / 43560]*26 percent vegetated). This potential loss of vegetation is addressed in the Drain Habitat Conservation Strategy (Section 3.5.4).<br><br>New structures that would be constructed on the drainage system would consist of control structures. Control structures are installed in steep drains that are eroding. Because of the erosion, drains needing control structures support little vegetation. Thus, construction of new control structures has a limited potential to affect tamarisk scrub habitat or associated covered species |

**TABLE 3.4-2**
Potential Effects of Covered Activities on Covered Species Associated With Tamarisk Scrub Habitat

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| Pipeline maintenance | Drain pipelines primarily occur in farm fields while conveyance system pipelines occur through developed areas. Neither of these areas support tamarisk scrub habitat. As such, the potential for pipeline maintenance to affect covered species is very low. |
| Reservoir maintenance | Reservoirs are located on the conveyance system. Vegetation is tightly controlled around the reservoir such that tamarisk scrub habitat does not develop. As such, continued reservoir maintenance would not likely affect species associated with tamarisk scrub habitat. |
| Sediment removal<br>Vegetation control | IID removes sediment from about 300 miles of drains annually. Mechanical and chemical control of vegetation is conducted in association with sediment removal as necessary. While IID strives to maintain vegetation on drain banks, vegetation within the channel bottom is removed with sediment, potentially including tamarisk. These activities can temporarily reduce the amount of vegetation in the drains. An estimated 130 acres of vegetated drain is affected by sediment removal and vegetation control each year of which about 43 acres are tamarisk. Vegetation impacts in the drains are addressed and mitigated by the Drain Habitat Conservation Strategy (Section 3.5.4).<br><br>Vegetation control along canals focuses on removing moss and algae. Thus, no effects to tamarisk scrub habitat would occur. |
| New and Alamo River maintenance | IID dredges the deltas of the New and Alamo rivers about once every four years. In conducting this dredging, IID retains the vegetation on the banks. Thus, tamarisk scrub habitat is not removed by these dredging operations, but the dredging could temporarily disturb covered species using tamarisk along the river channels. IID coordinates with USFWS at the refuge prior to conducting these activities.<br><br>Mechanical and chemical control is used to treat the banks around the 20 drop structures on the New and Alamo rivers. About 10 acres are treated annually. Because of this annual treatment, tamarisk cannot become established and develop enough to provide habitat for covered species. |
| Salton Sea dike maintenance | Salton Sea dike maintenance activities consist of replacing riprap, grooming embankments and repairing damaged sections of the dikes. Because tamarisk does not occur on or immediately adjacent to the dikes, no change in habitat would occur with these activities and no disturbance of covered species would be expected. |
| Gravel and rock quarrying | Tamarisk scrub habitat is not found at the gravel and rock quarries. Thus, quarrying is not likely to affect covered species associated with tamarisk scrub habitat. |
| Fish hatchery operation and maintenance | The fish hatchery is a developed facility and does not support habitat for covered species associated with tamarisk scrub habitat. |
| Recreational facilities | New recreational facilities could be constructed in association with IID's drain and canals. As described in Section 1.7, potential recreational facilities may include bikepaths, footpaths, picnic tables, and similar facilities. Because recreational facilities would not be constructed in the drain prism where tamarisk scrub habitat could occur, construction of recreational facilities would not be expected to affect habitat for species associated with this habitat. If recreational facilities were constructed adjacent to drains, there would be a minor potential for disturbance of covered species during construction. Vegetation along canals is tightly controlled such that it is unlikely that any tamarisk would be removed to develop recreational facilities along canals. Further, IID would not locate |

**TABLE 3.4-2**
Potential Effects of Covered Activities on Covered Species Associated With Tamarisk Scrub Habitat

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| | new recreational facilities in areas with extensive tamarisk due to the increased construction cost associated with removal of tamarisk. The HCP does not cover take of covered species by recreationists. |
| HCP/EIS/EIR mitigation | HCP measures consisting of habitat construction could eliminate some tamarisk scrub habitat depending on its specific location. However, IID would not locate habitat creation areas in areas with extensive tamarisk if possible due to the increased construction cost associated with removal of tamarisk. |

### 3.4.2.1 Habitat Changes at the Salton Sea

Covered species using tamarisk scrub also could be adversely affected by the water conservation and transfer programs if reductions in the sea elevation resulted in the loss of tamarisk scrub in shoreline strand and adjacent wetland areas around the Salton Sea. Impacts to covered species potentially resulting from changes in tamarisk scrub adjacent to the Salton Sea as a result of a reduced sea elevation are addressed as part of the Salton Sea Habitat Conservation Strategy (See Salton Sea–3 in Section 3.3.4.2). The following provides a general description of the nature and extent of potential changes in tamarisk scrub habitat adjacent to the Salton Sea. Mitigation for impacts to covered species using tamarisk scrub adjacent to the Salton Sea is covered under the Salton Sea Habitat Conservation Strategy.

The Salton Sea database identifies 293 acres of shoreline strand habitat along the Salton Sea. Shoreline strand habitat consists of tamarisk and iodine bush. In addition to the shoreline strand, the Salton Sea database identifies 2,349 acres of adjacent wetlands dominated by tamarisk. The source of the water that supports the shoreline strand community is uncertain but likely is the result of shallow groundwater rising to the surface at its interface to the Salton Sea. Depending on the extent to which seepage from the Salton Sea contributes to supporting the shoreline strand community and adjacent wetlands dominated by tamarisk, the water conservation program could result in a reduction in the amount of tamarisk scrub habitat. There is, however, considerable uncertainty about the extent of these possible changes. As the sea recedes, tamarisk could establish at lower elevations, replacing habitat lost at higher elevations. Alternatively, it has been suggested that tamarisk will not establish in areas exposed by a receding sea level because of excessive soil salinity (Reclamation and SSA 2000). In areas where relatively good quality drain water or shallow groundwater is the predominant water source, no change in tamarisk-dominated adjacent wetlands is expected. It is currently not possible to predict the magnitude of changes in tamarisk in shoreline strand and adjacent wetland areas as a result of the water conservation and transfer programs.

### 3.4.2.2 Permanent Habitat Loss in the Imperial Valley

Covered activities potentially resulting in the permanent loss of tamarisk scrub habitat in the Imperial Valley are installation of lateral interceptors, installation of seepage recovery systems, piping drains, and structure maintenance. The potential effects of each of these activities on habitat are described below. In total, an estimated 65.5 acres of tamarisk scrub could be lost because of the covered activities over the term of the permit.

As part of the water conservation and transfer project, IID could install 16 lateral interceptor systems (see Section 1.7). These systems consist of a canal and a reservoir about 40 surface acres in size. Some of the reservoirs could be located close to the New or Alamo rivers and their construction could result in removal of some tamarisk scrub adjacent to these rivers. IID anticipates that up to 15 acres of tamarisk scrub could be removed to construct reservoirs associated with lateral interceptor systems.

Seepage recovery systems are proposed along the East Highline Canal. Subsurface recovery systems are proposed where there is not an existing drain. These systems consist of an underground, perforated pipeline that collects the water and directs it to a sump. Along the East Highline Canal, the pipelines would be installed in close proximity to the outside toe of the canal embankment. Vegetation supported by seepage generally occurs on the embankment where it intercepts seepage water. Because the recovery system would be at the base of the embankment, vegetation would not be lost as a consequence of removing seepage water. However, construction would likely require removal of some of the seepage-supported vegetation. Construction to install these systems disturbs an area about 70 feet wide along the pipeline installation route. About 13.2 miles of pipeline are anticipated to be installed for the seepage recovery systems resulting in the removal of about 43 acres of tamarisk scrub habitat. This amount constitutes about 10 percent of the estimated 412 acres of tamarisk scrub habitat supported in seepage areas adjacent to the East Highline Canal in the HCP area.

Over the 75-year term, IID anticipates that about 50 miles of open drains (an annual average of 0.67 mile) would be pipelined. The entire drainage system encompasses an estimated 2,471 acres of which an estimated 26 percent (652 acres) is vegetated. Tamarisk comprises about 33 percent of the vegetation in the drains. Assuming that 26 percent of the 50 miles of drains piped is vegetated, 22 acres of drain vegetation could be lost over the term of the permit from piping drains. On average, about 7 acres could be tamarisk. This potential loss of vegetation in the drains is addressed through the Drain Habitat Conservation Strategy.

Structure maintenance with the potential to eliminate drain vegetation consists of installation of new drain crossings. IID estimates that six 40-foot-wide crossings will be constructed each year. Based on this estimate, 18,000 feet (3.4 miles) of drain would be affected by drain crossings over the term of the permit. Assuming the impacted area is 26 percent vegetated, about 1.5 acres of drain vegetation could be lost of which an estimated 0.5 acre could be tamarisk. This potential loss of vegetation in the drains is addressed through the Drain Habitat Conservation Strategy.

Tamarisk scrub habitat also occurs in some locations along the AAC in association with washes, where there is seepage from the canal or in other locations where water is available (e.g., from adjacent agricultural fields or from the LCR). As described in more detail in the Desert Habitat Conservation Strategy (see Section 3.6.2), the covered activities include replacement of structures along the AAC. Construction activities required to replace structures along the AAC could result in the removal of desert habitat or tamarisk scrub habitat. Under Desert Habitat–2, IID has committed to permanently remove no more than 100 acres of native desert habitat and tamarisk scrub habitat combined adjacent to the AAC and on the desert sides of the other canals adjacent to desert habitat. Thus, a maximum of an additional 100 acres of tamarisk scrub habitat (assuming all of the habitat impacted by construction along the canals adjacent to desert habitat is tamarisk scrub habitat) could be removed by the covered species.

### 3.4.2.3 Temporary Habitat Disturbance in the Imperial Valley

Covered activities potentially resulting in the temporary loss of tamarisk scrub habitat are sediment removal/vegetation control and structure maintenance. The potential effects of these activities are described below. In total, an estimated 43.2 acres of tamarisk could be temporarily disturbed by the covered activities each year. However, all of this tamarisk is in the drains and is addressed through the Drain Habitat Conservation Strategy.

The amount of vegetation in the drains was conservatively estimated at 652 acres; about 215 acres are tamarisk IID anticipates that it will clear vegetation/sediment from approximately one-fifth (about 130 acres) of the vegetated acreage in the drains each year. Thus, about 43 acres of tamarisk scrub and species associated with tamarisk scrub could be exposed to drain cleaning each year. Drain cleaning could displace individuals, temporarily reduce habitat in the localized area of the cleaning, or destroy nests if covered species breed in the drains. These potential impacts are addressed through the Drain Habitat Conservation Strategy.

Structure replacement could temporarily remove drain vegetation, some of which could be tamarisk. IID estimates that about 100 structures on drains will need to be replaced each year. Along lateral drains, replacing each structure temporarily disturbs an area about 75 feet long. Thus, each year about 7,500 feet (1.4 miles) of the drains would be disturbed, potentially resulting in the temporary removal of 0.6 acre of vegetation of which about 0.2 acre could be tamarisk. This potential impact is addressed through the Drain Habitat Conservation Strategy.

### 3.4.2.4 Summary of Habitat Effects in the Imperial Valley

Within the Imperial Valley, the covered activities have the potential to permanently remove 65.5 acres of tamarisk and temporarily disturb 43.2 acres (Table 3.4-3). All of the tamarisk potentially temporarily affected is in the drains and is addressed under the Drain Habitat Conservation Strategy. Of the 65.5 acres potentially permanently lost, 15 acres would be located along the New and/or Alamo rivers, 43 would be along the East Highline Canal, and 7.5 acres would be in the drainage system. The potential loss of 7.5 acres of tamarisk in the drains is addressed under the Drain Habitat Conservation Strategy. The 65.5 acres of potential permanent loss of tamarisk constitutes less than one percent of the quantified acreage of tamarisk scrub (Table 3.4-1). Up to an additional 100 acres of tamarisk scrub habitat could be lost of the term of permit from construction activities along the AAC.

**TABLE 3.4-3**

Potential Impacts to Tamarisk Scrub Habitat in the Imperial Valley

| Covered Activity | Acreage | Comments |
|---|---|---|
| **Permanent Loss** | | |
| Lateral interceptors | 15 | |
| Subsurface recovery systems | 43 | |
| Piping drains | 7 | Covered by Drain Habitat Conservation Strategy |
| Structure maintenance | 0.5 | Covered by Drain Habitat Conservation Strategy |
| Total permanent loss | 65.5 | 7.5 acres are covered by the Drain Habitat Conservation Strategy |
| **Temporary Loss** | | |
| Vegetation control/sediment removal | 43 | Covered by Drain Habitat Conservation Strategy |
| Structure maintenance | 0.2 | Covered by Drain Habitat Conservation Strategy |
| Total temporary loss | 43.2 | Covered by Drain Habitat Conservation Strategy |

### 3.4.3 Approach and Biological Goals

The overall goal of the Tamarisk Scrub Habitat Conservation Strategy is to provide habitat to support the species composition and seasonal occurrence of riparian-associated covered species that could use tamarisk scrub habitat in the HCP Area. This overall goal is to be accomplished through implementing measures to meet two specific objectives:

- Avoid and minimize take of covered species associated with removal of tamarisk scrub habitat
- Create or acquire and preserve native tree habitat to mitigate any take of covered species caused by removal of tamarisk

### 3.4.4 Tamarisk Scrub Habitat Mitigation and Management Measures

The mitigation and management measures described below are the specific actions that IID will undertake to fulfill the goals of the Tamarisk Scrub Habitat Conservation Strategy. The key elements of the conservation strategy are as follows:

- Minimize take, including disturbance, of covered species associated with tamarisk scrub habitat as a result of construction activities
- Acquire or create, and preserve native tree habitat to mitigate for the take of covered species resulting from the loss of tamarisk scrub or native tree/shrub habitat permanently removed as a result of construction activities

***Tree Habitat–1.*** *For scheduled construction activities (except for the installation of subsurface seepage recovery systems – see Tree Habitat – 2), the site will be surveyed before initiation of construction activities. If tamarisk scrub habitat occurs on the project site and would be affected by the construction activities or operation of the constructed facilities, the acreage and plant species composition of the affected vegetation will be determined.*

*For tamarisk that would be permanently lost, IID will create or acquire native tree habitat consisting of mesquite bosque or cottonwood-willow habitat. The amount of habitat to acquire or create will be calculated based on the following ratios.*

- *If IID creates habitat prior to conducting the construction activities, the mitigation ratio for the acreage of created habitat to lost acreage of tamarisk will be 0.25:1 as long as the created habitat meets the success criteria.*
- *If IID creates habitat after conducting the construction activities or if IID acquires existing habitat, the mitigation ratio for the acreage of the created or acquired habitat to lost acreage of tamarisk will be 0.75:1. The habitat will be created or acquired within 1 year of initiation of the construction activities unless otherwise agreed to by IID, USFWS, and CDFG.*

*For native tree habitat that would be removed by construction activities, IID will create or acquire native tree habitat consisting of mesquite bosque or cottonwood-willow habitat at a 3:1 ratio for the acreage impacted. The habitat will be created or acquired within 1 year of initiation of the construction activities unless otherwise agreed to by IID, USFWS, and CDFG.*

*If IID elects to acquire habitat, IID will work with the HCP IT to identify a property for acquisition. Habitat to be acquired must support mesquite bosque or cottonwood-willow habitat, occur within the Salton Sea Basin and meet with the approval of the USFWS and CDFG. If the only available properties that meet these requirements are larger than required to compensate for the lost acreage, IID will acquire the least expensive property. IID can use the additional acreage of the acquired habitat to fulfill the mitigation obligations of Tree Habitat–1 or Tree Habitat–2 for future projects, or Salton Sea–3. IID will place a conservation easement on acquired lands and provide for the property to be managed for covered species in perpetuity. With the approval of USFWS and CDFG, which approval shall not be unreasonably withheld, IID may transfer the land to a third party who agrees to and is authorized to manage the land for habitat conservation purposes. If IID transfers the land to a third party, IID will establish an endowment fund adequate to provide for the management of the lands in perpetuity.*

*If IID elects to create habitat, IID will work with the HCP IT to develop a habitat creation plan. The habitat creation plan will include the following information:*

- *Location*
- *Planting plan (including species composition and layout)*
- *Grading and other construction activities*
- *Long-term management practices*
- *Vegetation and species use monitoring*
- *Success criteria for the plantings and the actions that IID will take if the success criteria are not met*

*IID will submit habitat creation plans to the USFWS and CDFG for approval prior to initiation of habitat creation activities. IID will provide for the management of created native tree habitat in perpetuity.*

*For created and acquired habitat, IID will work with the HCP IT to prepare a management plan for the property that describes how the property will be managed. The management plan will describe the actions that IID will take to maintain the ecological functions of the created and acquired habitat. While the specific management needs will vary depending on the property, considerations for the management plan include:*

- *Measures to control human access (e.g., fencing, signage)*
- *Frequency at which land will be visited to assess maintenance/management needs*
- *Types of maintenance action (e.g., removing garbage, repairing fences)*
- *Vegetation management practices (e.g., prescribed burning, removal of exotic plants)*

*IID will submit management plans to the USFWS and CDFG for approval within 1 year of completing habitat creation activities or recording a conservation easement for acquired habitat.*

IID will undertake a variety of construction activities in the future, primarily as part of the water conservation and transfer project and to modernize and rehabilitate its facilities. As described above, these construction activities have the potential to remove a small amount of tamarisk scrub vegetation which has a small potential to result in take of a covered species. This mitigation measure addresses this potential take by requiring site-specific surveys for every scheduled construction activity to determine if the construction would impact tamarisk scrub habitat and subsequently taking actions to compensate for the loss if habitat would be permanently lost because of the construction. By conducting site-specific

surveys, IID will determine if any tamarisk scrub habitat will be affected and create native tree habitat to replace lost habitat values. If areas of tamarisk scrub habitat will be affected, IID will create or acquire and preserve native tree habitat at a 0.25:1 or 0.75:1 mitigation ratio.

The 0.25:1 mitigation ratio for tamarisk was derived based on the relative value of the habitat affected (i.e., tamarisk scrub) and the habitat that would be created (i.e., cottonwood-willow or mesquite bosque). Anderson and Ohmart (1984) developed a classification system for riparian plant communities along the LCR based on the plant species composition and structural characteristics. Their plant species composition categories are cottonwood-willow, tamarisk, screwbean mesquite, honey mesquite, tamarisk/honey mesquite, and arrowweed. The structural classes and their characteristics are described in Table 3.4-4. Anderson and Ohmart (1984) further assigned a habitat value rating to each plant community/structural class that ranged from 1 (lowest value) to 26 (highest value). Based on this rating system, tamarisk scrub habitats have low habitat value ratings for all structural classes, ranging from 3 to 8 units (Table 3.4-5). Tamarisk is considered to be a relatively unimportant plant community for most bird species along the LCR (Rice et al. 1980). In contrast, the habitat value ratings for cottonwood-willow communities range from 17 to 26 for communities that contained trees greater than 15 feet tall. Cottonwood-willow stands with few cottonwood trees greater than 15 feet tall, have a similar habitat value rating as tamarisk communities. Similarly, honey mesquite communities have high habitat value ratings.

**TABLE 3.4-4**
Structural Characteristics of Riparian Vegetation According to Anderson and Ohmart (1984) Classification System

| Structure Type | Characteristics |
|---|---|
| I | Mature stand with distinctive overstory greater than 15 feet in height, intermediate class from 2 to 15 feet, tall, and understory from 0 to 2 feet tall. |
| II | Overstory is greater than 15 feet tall and constitutes greater than 50 percent of the trees with little or no intermediate class present. |
| III | Largest proportion of trees is between 10 and 20 feet in height with few trees above 20 feet or below 5 feet in height. |
| IV | Few trees above 15 feet present. Fifty percent of the vegetation is 5 to 15 feet tall with the other 50 percent between 1 to 2 feet in height. |
| V | Sixty to 70 percent of the vegetation present is between 0 to 2 feet tall, with the remainder in the 5- to 15-foot class. |
| VI | Seventy-five to 100 percent of the vegetation from 0 to 2 feet in height. |

The structural characteristics of the tamarisk scrub in the HCP area has not been determined with the exception of the tamarisk present in seepage areas along the AAC between Drops 2 and 3 and between Drops 3 and 4. The tamarisk scrub in these areas is structural types III and V (Reclamation and IID 1994). These structural types are likely to be the predominant types within the HCP area as well. Thus, the tamarisk scrub in the HCP area provides a relative habitat value of 5. The cottonwood-willow community between Drops 3 and 4 was structural type IV with a relative habitat value of 19 (Reclamation and IID 1994) suggesting that at least a structural type IV community can be created in the native tree habitats. This

seepage community also supports a honey mesquite community of structural type IV with a relative habitat value rating of 21. Thus, it is reasonable to expect that created or acquired

**TABLE 3.4-5**
Wildlife Habitat Value Rating for Tamarisk and Cottonwood-Willow Habitats

| Community/Structure | Value |
|---|---|
| **Cottonwood-Willow** | |
| Type I | 17 |
| Type II | 23 |
| Type III | 26 |
| Type IV | 19 |
| Type V | 5 |
| Type VI | 6 |
| **Honey Mesquite** | |
| Type III | 20 |
| Type IV | 21 |
| Type V | 10 |
| Type VI | 9 |
| **Tamarisk** | |
| Type I | 4 |
| Type II | 8 |
| Type III | 5 |
| Type IV | 3 |
| Type V | 5 |
| Type VI | 7 |
| **Mixed Communities**[a] | |
| Saltcedar/palms V | 10 |
| Saltcedar/honey mesquite IV | 8 |
| Saltcedar/honey mesquite V | 7.5 |
| Saltcedar/honey mesquite/palms V | 12.5 |
| Screwbean mesquite/palms IV | 14 |
| Screwbean mesquite/palms V | 14 |

Source: Anderson and Ohmart (1984, presented in Reclamation and IID 1994) unless noted
[a]USFWS (1993)

native tree habitat would provide at least a relative habitat value of 19. As compared to tamarisk scrub with a relative habitat value of 5, the created native tree habitat with a relative habitat value of 19, would provide a habitat value about 4 times greater than the value of the tamarisk scrub currently available. As such, using a 0.25:1 mitigation ratio would result in a similar habitat value in the created native tree habitat as the tamarisk scrub habitat.

If native tree habitat is created prior to removal of tamarisk by construction activities, the habitat will be available to covered species at the time the tamarisk is removed. As described above, native tree habitat is four times more valuable to wildlife than tamarisk and creating native tree habitat at a 0.25:1 ratio prior to removal of tamarisk would ensure that there would be not net loss of habitat value for covered species. If native tree habitat is created after tamarisk is removed, there would be slight reduction in habitat value between when the tamarisk is removed and the created habitat is installed and develops into functional habitat. A higher mitigation ratio (0.75:1) is used to account for this delay. If IID elects to acquire existing habitat, there could still be a slight reduction in habitat value because of an overall net loss in acreage. A higher mitigation ratio (0.75:1) is used to account for the net loss.

***Tree Habitat–2.*** *If IID installs subsurface seepage recovery systems on the East Highline Canal, prior to the initiation of construction, IID will determine the acreage of seepage community vegetation that will be removed and permanently lost because of the construction. For seepage community vegetation that would be permanently lost, IID will create or acquire native tree habitat consisting of mesquite bosque or cottonwood-willow habitat. The amount of habitat to acquire or create will be calculated based on the following ratios.*

- *If IID creates habitat prior to installing the subsurface recovery systems, the mitigation ratio for the acreage of created habitat to lost acreage of tamarisk will be 0.5:1 as long as the created habitat meets the success criteria.*
- *If IID creates habitat after installing the subsurface recovery systems, the mitigation ratio for the acreage of the created or acquired habitat to lost acreage of tamarisk will be 1.5:1. The habitat will be created or acquired within 1 year of initiation of construction activities unless otherwise agreed to by IID, USFWS, and CDFG.*

*If IID elects to acquire habitat, IID will work with the HCP IT to identify a property for acquisition. Habitat to be acquired must support mesquite bosque or cottonwood-willow habitat, occur within the Salton Sea Basin and meet with the approval of the USFWS and CDFG. If the only available properties that meet these requirements are larger than required to compensate for the lost acreage, IID will acquire the least expensive property. IID can use the additional acreage of the acquired habitat to fulfill the mitigation obligations of Tree Habitat–1 or Tree Habitat–2 for future projects, or Salton Sea–3. IID will place a conservation easement on acquired lands and provide for the property to be managed for covered species in perpetuity. With the approval of USFWS and CDFG, which approval shall not be unreasonably withheld, IID may transfer the land to a third party who agrees to and is authorized to manage the land for habitat conservation purposes. If IID transfers the land to a third party, IID will establish an endowment fund adequate to provide for the management of the lands in perpetuity.*

*If IID elects to create habitat, IID will work with the HCP IT to develop a habitat creation plan. The habitat creation plan will include the following information:*

- *Location*
- *Planting plan (including species composition and layout)*
- *Grading and other construction activities*
- *Long-term management practices*
- *Vegetation and species use monitoring*

- *Success criteria for the plantings and the actions that IID will take if the success criteria are not met*

*IID will submit habitat creation plans to the USFWS and CDFG for approval prior to initiation of habitat creation activities. IID will provide for the management of created native tree habitat in perpetuity.*

*For created and acquired habitat, IID will work with the HCP IT to prepare a management plan for the property that describes how the property will be managed. The management plan will describe the actions that IID will take to maintain the ecological functions of the created or acquired habitat. While the specific management needs will vary depending on the property, considerations for the management plan include:*

- *Measures to control human access (e.g., fencing, signage)*
- *Frequency at which land will be visited to assess maintenance/management needs*
- *Types of maintenance action (e.g., removing garbage, repairing fences)*
- *Vegetation management practices (e.g., prescribed burning, removal of exotic plants)*

*IID will submit management plans to the USFWS and CDFG for approval within 1 year of completing habitat creation activities or recording a conservation easement for acquired habitat.*

IID may install subsurface seepage recovery systems along the East Highline Canal as part of the water conservation and transfer program. The plant communities adjacent to the East Highline Canal that are supported by seepage from the canal consist of a wide variety of plants, including tamarisk, mesquite, arrowweed, common reed, and a few cottonwoods. Covered species associated with tamarisk scrub habitats could use these plant communities. Installation of subsurface seepage recovery systems would result in the loss of some vegetation and the USFWS and CDFG identified potential take of covered species from removal of a portion of the seepage community vegetation. This measure will mitigate potential impacts of the take of covered species that could result from construction of subsurface seepage recovery systems by acquiring or creating native tree vegetation sufficient to offset lost habitat value.

The 0.5:1 mitigation ratio was derived from relative habitat value ratings for mixed communities (Table 3.4-5). The vegetation of the seepage communities consists of a mix of species, including but not limited to tamarisk, mesquite, *Atriplex*, nonnative palms, cottonwoods, and *Phragmites*. Depending on the species composition and structural conditions, the habitat value ratings for mixed communities range from 7.5 to 14. The habitat value of seepage communities is probably on the lower end of this range because of the preponderance of nonnative species. As described above, the created or acquired habitat would be expected to have a habitat value of at least 19, about twice the value of the seepage communities. Thus, a 0.5:1 mitigation ratio would be adequate to offset any loss in habitat value from removal of seepage communities along the East Highline Canal.

For the same reason as described under Tree Habitat–1, a higher mitigation ration (1.5:1) is used if the habitat is created after the subsurface seepage recovery systems are installed or if habitat is acquired.

**Tree Habitat–3.** *For scheduled construction activities, including installation of subsurface seepage recovery systems, that will remove tamarisk, cottonwoods, willows or mesquite, the site will be*

*surveyed to determine whether any covered species are potentially breeding at the site. If covered species are found to be potentially breeding on the project site, IID will schedule the construction activities that directly affect habitat to occur outside of the breeding season.*

In addition to potentially reducing the amount of tamarisk scrub habitat available to covered species, construction activities could disturb or injure covered species using the habitat. The effect of disturbance and the potential for injury would be greatest on covered species if covered species were nesting in the habitat to be removed by construction. To minimize the potential for take of covered species from construction activities, IID will survey tamarisk, cottonwood, willow or mesquite vegetation to determine if any covered species are breeding in the habitat that would be affected by the construction activities. If the surveys indicate that covered species are likely to be breeding in the habitat that would be affected, IID will schedule activities that would affect the habitat to occur outside of the breeding season. Outside of the breeding season, IID could remove the habitat. By scheduling construction activities that would affect habitat to occur outside of the breeding season, IID will minimize the potential to injure or disturb a covered species.

### 3.4.5 Effects on Habitat

Tamarisk is a nonnative species that has invaded riparian areas of the southwest and readily colonizes non-riparian areas with adequate soil moisture. Tamarisk is considered poor quality habitat for native wildlife species although some wildlife species have adapted to using tamarisk where it has displaced native vegetation. Tamarisk can form dense monocultures with little structural diversity. Bird species diversity and abundance have been found to be lower in tamarisk than in stands of native riparian vegetation. There have been 32 riparian-dependent bird species identified in the Southwestern U.S. (Anderson and Ohmart 1984, Kelly and Finch 1999), with 26 of these species requiring broadleaf trees for nesting and breeding along the Lower Color River and cannot fulfill these life requisites in tamarisk (Anderson and Ohmart 1984, Kelly and Finch 1999). Two groups, large raptors, and cavity nesting species, are not known to occur in tamarisk. Tamarisk's growth form is generally as a large shrub that does not possess the structural characteristics required by species such as raptors or woodpeckers that rely on trees as perch and/or nest sites. Some birds have been found to use tamarisk for nesting along the Rio Grande and Pecos Rivers in New Mexico, but are broadleaf obligates at lower elevations along the Colorado River. The discrepancy in use of tamarisk between these two areas is believed to be caused by a difference in temperature extremes between the higher elevation eastern watersheds and the low elevation rivers of southwest Arizona and California. Most tamarisk habitat along the LCR lacks the species diversity and canopy structure necessary to ameliorate extreme climate conditions and as a result does not provide suitable habitat for many of the species known to successfully breed in tamarisk farther east (Hunter et al. 1985, 1987, and 1988). These studies indicate the poor quality of tamarisk as wildlife habitat.

Tamarisk currently is common and abundant in the HCP area, having colonized areas adjacent to the New and Alamo Rivers, agricultural drains, areas adjacent to the Salton Sea and areas receiving seepage or agricultural runoff (Table 3.4-1). Construction of lateral interceptors and subsurface recovery systems could result in the removal of 58 acres of tamarisk scrub which constitutes less than one percent of the quantified acreage of tamarisk scrub in the HCP area (Table 3.4-3). These acres are addressed through Tamarisk Scrub

Habitat Conservation Strategy (Tree Habitat–1 and –2). Thus, tamarisk would be expected to remain locally and regionally abundant. Furthermore, because of its poor quality and high abundance, the distribution and amount of tamarisk is not likely to limit the abundance or distribution of any covered species. Nonetheless, because tamarisk is known to be used by several covered species, the Tamarisk Scrub Habitat Conservation Strategy includes habitat creation or acquisition to offset any take of covered species resulting from a local reduction in the distribution or abundance of tamarisk. Created or acquired native tree habitat would provide higher quality habitat, increase habitat diversity in the HCP area, and provide true tree habitat for covered species.

## 3.4.6 Effects on Covered Species

Tamarisk is not a preferred habitat for any of the covered species. Most of the covered species potentially using this habitat are considered riparian species associated with native riparian plant communities such as cottonwoods, willows, palo verde, and mesquite. Covered species associated with tamarisk scrub fall into this category because tamarisk scrub represents the only tree-dominated habitat in the HCP area. Covered species potentially using tamarisk scrub habitats in the HCP area include resident breeding species, migratory breeding species, winter visitors, and transient species that may visit tamarisk scrub habitat during migration or other wanderings. The effects of the Tamarisk Scrub Habitat Conservation Strategy on covered species are evaluated below.

As part of the Monitoring and Adaptive Management Program (Chapter 4), IID could implement a survey or study program requiring capture of covered species. Capture of covered species constitutes take under both the federal and state ESAs. Take that occurs in association with surveys or studies conducted for this HCP is a covered activity and will be authorized under the state and federal ITPs. Any of the covered species could be taken through surveys or studies.

Studies and surveys conducted during the course of this HCP will be developed by IID in coordination with the HCP IT and will be subject to the approval of CDFG and USFWS prior to implementation. In approving the studies/surveys, the CDFG and USFWS will require capture methods that minimize the potential for death and injury of covered species. In addition, these agencies will specify the number of individuals of covered species that may be captured. Thus, the level of take authorized to occur through this mechanism will be specified on a case-by-case basis through the approval of the CDFG and USFWS.

### 3.4.6.1 Willow Flycatcher

Willow flycatchers consistently occur in the HCP area during migration. They are not known to breed in the HCP area, but recent observations of willow flycatchers during the breeding season along the Whitewater River suggest that this species could breed in the HCP area in the future. Willow flycatchers typically are associated with willow thickets. Willow thickets do not exist in the HCP area, but willow flycatchers have been reported using tamarisk and common reed along the Salton Sea and agricultural drains, and in seepage communities adjacent to the East Highline Canal during migration.

Willow flycatchers could be directly or indirectly taken as a result of several covered activities. Willow flycatchers have been reported using vegetation in the drains and could occur along the New and Alamo rivers as well. Drain and river maintenance activities could

flush willow flycatchers from drain vegetation which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation they are subject to predation.

On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. Much of this vegetation could be used by willow flycatchers. The New and Alamo rivers are dredged about every four years which similarly could affect willow flycatchers. Currently, willow flycatchers are only known to occur in the HCP area during migration. With 80 percent of the drain vegetation undisturbed each year and considering IID would be actively cleaning only a fraction of the 20 percent of the drainage system that is maintained each year during the period when willow flycatchers are in the HCP area, the potential for take and the level of take resulting from displacement of birds by drain maintenance activities is low. In the event that willow flycatchers currently are breeding in drain vegetation in the HCP area or start breeding in the HCP area over the 75-year permit term, drain maintenance activities could result in the direct destruction of nests.

Drain maintenance activities and several other covered activities also have the potential to result in take of willow flycatchers through temporary or permanent reductions in the amount of tamarisk scrub habitat. As shown in Table 3.4-3, various maintenance and water conservation activities have the potential to temporarily impact about 43.2 acres of tamarisk scrub habitat and permanently impact about 65.5 acres in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. In addition, a reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. These reductions in tamarisk scrub habitat could reduce foraging opportunities and cover for willow flycatchers. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction. Because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), low level of use of the HCP area by willow flycatchers and poor quality of tamarisk as habitat for willow flycatchers, overall population-level effects would not be expected.

Various construction activities anticipated by IID have the potential to remove tamarisk scrub habitat that could be used by willow flycatchers. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). Because of the abundance of tamarisk scrub habitat in the HCP area (more than 7,500 acres) and small amount of habitat that would be permanently impacted by construction activities over the term of the permit, the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal. If willow flycatchers nest in the HCP area over the term of the permit, construction activities could result in the destruction of nests during habitat removal. Tamarisk is poor quality habitat for willow flycatchers and the HCP area is outside this species' currently known breeding range. As such, the number of willow flycatchers potentially breeding in the HCP area over the term of the permit would be expected to be low. Given this low level of expected use and the small amount of habitat that would be impacted, the amount of take attributable to nest destruction during construction activities would be very low.

Implementation of the Tamarisk Scrub Habitat Conservation Strategy would be expected to maintain or improve habitat value for willow flycatchers in the HCP area. Native tree habitat would be created or acquired, and preserved to replace any tamarisk scrub habitat that would be permanently lost as a result of the construction activities (see Tree Habitat–1 and –2). As part of the Salton Sea Habitat Conservation Strategy, native tree habitat also would be created or acquired, and preserved if a net loss of tamarisk scrub habitat occurs within the shoreline strand or adjacent wetlands. Consisting of native plant species, the created or acquired habitat would be expected to provide better habitat quality for willow flycatchers than the tamarisk that would be lost. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would offset the reduction in habitat value for willow flycatchers resulting from reductions in the amount of tamarisk scrub thus mitigating the impact of take potentially resulting from changes in habitat.

Although willow flycatchers currently are not known to breed in the HCP area, IID will implement measures to avoid and minimize impacts of construction activities on willow flycatchers that could breed in the HCP area in the future. Under Tree Habitat–3 and Drain Habitat–3, prior to conducting scheduled construction activities IID will survey construction areas and if covered species are found breeding in impacted areas, IID will schedule construction to occur outside the breeding season. With this measure, IID will minimize the potential for construction activities to destroy nests.

Implementation of the HCP measures would minimize and mitigate the impact of take of willow flycatchers that could result from the covered activities and would not jeopardize the continued existence of this species. Based on (1) the low level of use of the HCP area by willow flycatchers, (2) the low quality of tamarisk as habitat for this species, (3) the abundance of potential habitat in and around the HCP area, and (4) implementation of measures to minimize take of flycatchers, the potential for take and the magnitude of take of willow flycatchers as a result of the covered activities is low. Creation or acquisition and long-term protection of native tree habitat would provide high quality habitat for willow flycatcher in perpetuity. This long-term protection of native habitat would ensure the availability of migratory stopover habitat and nesting opportunities for willow flycatcher of at least equivalent value (considering both acreage and quality) as the tamarisk scrub habitat impacted by the covered activities, thus mitigating take of willow flycatcher that could result from reductions in the amount of tamarisk scrub habitat. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of willow flycatcher.

#### 3.4.6.2 Least Bell's Vireo

Least Bell's vireo occurs accidentally in the HCP area during migration. This low level of use is reflected by only two observations of this species at the Salton Sea NWR. On the rare occasion that it does occur in the HCP area, it could use tamarisk as the only available tree or shrub habitat. Because of the very low level of use, it is very unlikely that any least Bell's vireo would be taken as a result of the covered activities. Nonetheless, over the term of the permit, it is possible for a covered activity to directly or indirectly cause take of a least Bell's vireo.

On the rare occasions that this species occurs in the HCP area, they would be expected to use trees or shrubs because their typical habitat consists of native riparian habitat. As the dominant tree and shrub, tamarisk is the most likely habitat that least Bell's vireo would use in the HCP area. Among other locations, tamarisk occurs in the drains. Drain maintenance activities could flush least Bell's vireo from drain vegetation which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation they are subject to predation. On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. Much of this vegetation could be used by least Bell's vireo. Currently, least Bell's vireo are known only as accidentals in the HCP area. As a result, the likelihood of drain maintenance activities being conducted in an area coincident with a vireo is remote and the potential for take and the extent of take through this mechanism is very low.

Drain maintenance activities and several other covered activities have the potential to result in take of least Bell's vireo through temporary or permanent reductions in the amount of tamarisk scrub habitat. As shown in Table 3.4-3, various maintenance and water conservation activities have the potential to temporarily impact about 43.2 acres of tamarisk scrub habitat and permanently impact about 65.5 acres. In addition, a reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea and construction along the AAC or other canals adjacent to desert habitat could remove up to 100 acres of tamarisk scrub habitat. These reductions in tamarisk scrub habitat could reduce foraging opportunities and cover for least Bell's vireo. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), accidental use of the HCP area by least Bell's vireo and poor quality of tamarisk as habitat for this species, no adverse population-level effects would be expected.

Various construction activities anticipated by IID have the potential to remove tamarisk scrub habitat that could be used by least Bell's vireo. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). Because of the abundance of tamarisk scrub habitat in the HCP area (more than 7,500 acres), the small amount of habitat the would be permanently impacted by construction activities over the term of that permit, and few individuals anticipated to occur in the HCP area, the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal.

Implementation of the Tamarisk Scrub Habitat Conservation Strategy would be expected to maintain or improve habitat value for least Bell's vireo in the HCP area. Native tree habitat would be created or acquired, and preserved to replace any tamarisk scrub habitat that would be permanently lost as a result of the construction activities (see Tree Habitat–1 and –2). As part of the Salton Sea Habitat Conservation Strategy, native tree habitat also would be created or acquired, and preserved if a net loss of tamarisk scrub habitat occurs within the shoreline strand or adjacent wetlands. Consisting of native plant species, the created or acquired habitat would be expected to provide better habitat quality for least Bell's vireo than the tamarisk that would be lost. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would offset any reduction in habitat value for least Bell's vireo resulting

from reductions in the amount of tamarisk scrub thus mitigating the impact of take potentially resulting from changes in habitat.

Implementation of the HCP measures would minimize and mitigate the impact of take of least Bell's vireo that could result from the covered activities and would not jeopardize the continued existence of this species. Based on (1) the accidental use of the HCP area by least Bell's vireo, (2) the low quality of tamarisk as habitat for this species, and (3) the abundance of potential habitat in and around the HCP area, the potential for take and the magnitude of take of least Bell's vireo as a result of the covered activities is very low. Creation or acquisition and long-term protection of native tree habitat would provide high quality habitat for least Bell's vireo in perpetuity. This long-term protection of native habitat would ensure the availability of habitat in the HCP area for least Bell's vireo of at least equivalent value (considering both acreage and quality) as the tamarisk scrub habitat impacted by the covered activities, thus mitigating take of least Bell's vireo that could result from reductions in the amount of tamarisk scrub habitat. With the compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of least Bell's vireo.

#### 3.4.6.3 Arizona Bell's Vireo

Historically and currently, the distribution of Arizona Bell's vireo is limited to areas along the LCR. The nearest known occurrence of this species to the HCP area is from eastern Imperial County near the Colorado River. Arizona Bell's vireo is closely associated with native riparian habitat.

The Arizona Bell's vireo has not be reported in the Imperial Valley, but over the term of the permit its range could expand to include this portion of the HCP area. If such a range expansion occurs, Arizona Bell's vireo could be subject to take from the covered activities in the same manner as described for the willow flycatcher. Arizona Bell's vireo is more likely to occur in seepage areas along the AAC or in other shrub or tree habitats closer to the LCR than tamarisk scrub habitat found in the Imperial Valley. Temporary or permanent removal of tamarisk scrub habitat along the AAC (e.g., in the seepage community between Drops 3 and 4) is not anticipated. Construction and O&M activities along the AAC present a minor potential to disturb Arizona Bell's vireo that might use tamarisk scrub habitat in seepage areas.

Implementation of the HCP measures would minimize and mitigate the impact of take of Arizona Bell's vireo that could result from the covered activities and would not jeopardize the continued existence of this species. Based on: (1) the very low level of use of the HCP area by Arizona Bell's vireo, (2) the low quality of tamarisk as habitat for this species, and (3) the abundance of potential habitat in and around the HCP area, the potential for take and the magnitude of take of Arizona Bell's vireo as a result of the covered activities is very low. Creation/acquisition and long-term protection of native tree habitat would make high quality habitat available for this species in perpetuity. This long-term protection of native habitat would ensure the availability of habitat in the HCP area for Arizona Bell's vireo of at least equivalent value (considering both acreage and quality) as the tamarisk scrub habitat impacted by the covered activities, thus mitigating take of Arizona Bell's vireo that could result from reductions in the amount of tamarisk scrub habitat. With the compensation for

take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of Arizona Bell's vireo.

#### 3.4.6.4 Swainson's Hawk

Swainson's hawks are occasional visitors to the Salton Sea area during their spring and fall migrations. They are not known to breed in the HCP area. For foraging, Swainson's hawk frequent agricultural fields. Trees and utility poles are used as perch and roost sites. Agricultural fields that Swainson's hawks can use for foraging are abundant in the HCP area.

The extent to which the Swainson's hawks use individual fields could be related to the availability of perch sites in the vicinity of the fields. Although tamarisk is abundant in the HCP area, tamarisk probably provides few perching opportunities for Swainson's hawk because it typically remains a large shrub, lacking the more robust and open structure required by Swainson's hawk for perching and roosting. As such, Swainson's hawks probably would not be affected by the projected reduction in tamarisk scrub habitat. Take of Swainson's hawks potentially resulting from reductions in agricultural field habitat is described in Section 3.8.6.2: Agricultural Field Habitat Conservation Strategy.

Under the Tamarisk Scrub Habitat Conservation Strategy, native tree habitat would be created/acquired, and preserved to replace tamarisk scrub habitat that would be permanently lost as a result of the construction activities. This created or acquired habitat would provide better habitat for Swainson's hawk because of the presence of trees that the hawks could use for roosting or perching while foraging. Additional benefits could be realized if native tree habitat is created as part of the Salton Sea Habitat Conservation Strategy. Creation of native tree habitat could increase the accessibility of foraging habitat for Swainson's hawks by providing perch sites near agricultural fields in areas previously lacking suitable perches. If native tree habitat was acquired to compensate for reductions in tamarisk scrub habitat, Swainson's hawks could benefit from the long-term certainty that perch and roost sites would be available in the HCP area. No take of Swainson's hawks is anticipated as a result of removal of tamarisk, but this species could benefit from implementation of the Tamarisk Scrub Habitat Conservation Strategy.

#### 3.4.6.5 Gila Woodpecker

Gila woodpeckers have been observed at a number of locations in the Imperial Valley in areas that support large trees, such as near towns and houses. They also are known to occur along the AAC in areas with trees supported by seepage, or in association with telephone poles that may also be used to create nesting cavities. The species may breed in these locations. The Gila woodpecker has declined dramatically in California. Loss and degradation of mature riparian habitat and saguaros have been implicated as the primary reason for this decline.

Tamarisk is very poor habitat for Gila woodpeckers. The few birds that have been observed using tamarisk along the LCR are believed to be dispersing juveniles rather than territorial adults (Larsen 1987). Gila woodpeckers have not been found to nest in tamarisk (Larsen 1987). Where other tree species occur within tamarisk scrub habitat (e.g., seepage communities along the East Highline Canal or AAC), Gila woodpeckers could find suitable nesting habitat. Based on the overall low level of use and lack of use by breeding birds, the

potential for the covered activities to result in take of Gila woodpeckers is low. In the Imperial Valley, Gila woodpeckers are only known to occur in association with trees in urban areas or agricultural operations (e.g., ranch yards).

Drain maintenance activities would not be expected to impact Gila woodpeckers because, as a result of regular maintenance trees do not grow large enough to provide habitat for this species. However, as shown in Table 3.4-3, various other covered activities have the potential to permanently impact about 65.5 acres and tamarisk scrub habitat in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. Installation of seepage recovery systems along the East Highline Canal in particular, have the potential to impact habitat for Gila woodpecker. Depending on the plant species composition of the areas impacted, the loss of tamarisk scrub habitat could reduce foraging and/or nesting opportunities for Gila woodpeckers. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction. Because of the low level of use of the HCP area by Gila woodpeckers, generally poor quality of tamarisk scrub habitat as habitat for Gila woodpeckers, and continued availability of trees in urban areas or in ranch yards, no adverse population-level effects would be expected.

The potential for Gila woodpeckers to be disturbed or injured as a result of the covered activities is low because this species is typically found in association with trees in urban areas or agricultural fields. Few, if any, of the covered activities would be conducted near areas supporting trees. Nonetheless, some potential for take of Gila woodpeckers is associated with construction activities that could destroy a nest if an occupied nest tree is removed. Under the Tamarisk Scrub Habitat Conservation Strategy, IID will survey areas that would be disturbed during construction to determine if any covered species, including Gila woodpeckers, are breeding in habitat that would be disturbed. Removal of habitat will be avoided until after the breeding season and native tree habitat created to compensate for tamarisk scrub or cottonwood-willow habitat that is permanently lost. These measures will minimize and mitigate any take of Gila woodpeckers as a result of construction activities.

Implementation of the Tamarisk Scrub Habitat Conservation Strategy could benefit Gila woodpeckers. The availability of trees suitable for excavating nesting cavities has been identified as a limiting factor for Gila woodpeckers (Larsen 1987). Under the Tamarisk Scrub Habitat Conservation Strategy, native tree habitat would be created/acquired, and preserved in perpetuity. Native trees such as cottonwoods and mesquite would be an important component of this habitat. Given the limited availability of trees of suitable size and wood characteristics in the HCP area, the creation or long-term preservation of native tree habitat would contribute to maintaining or increasing the availability of nest trees suitable for Gila woodpecker over the term of the permit. With their apparent tolerance for human activity and willingness to exploit suitably sized trees, regardless of species, Gila woodpeckers would likely exploit the trees provided under Tamarisk Scrub Habitat Conservation Strategy. Gila woodpeckers would further benefit if native tree habitat was created or acquired, and preserved as part of the Salton Sea Habitat Conservation Strategy. Given the limited potential for take of Gila woodpecker as a result of covered activities, the beneficial aspects of the Tamarisk Scrub Habitat Conservation Strategy would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of this species.

### 3.4.6.6 Gilded Flicker

Gilded flickers have habitat requirements similar to those of the Gila woodpecker described above and similarly are believed to have declined in California because of loss of mature riparian habitat and saguaros. Unlike Gila woodpeckers, they appear intolerant of human activity and have not been reported in the Imperial Valley. Their occurrence along the AAC is unknown but possible.

Little potential habitat for gilded flickers exists in the HCP area. The few trees available in the Imperial Valley are generally located near human activity, such as in parks, residential areas, or on ranches. Because they have a low tolerance for human activity and are not known to use tamarisk, gilded flickers are unlikely to occur in the Imperial Valley. Like the Gila woodpecker, they would be most likely to occur in association with the seepage communities along the East Highline Canal or AAC.

Drain maintenance activities would not be expected to impact gilded flicker because, as a result of regular maintenance trees do not grow large enough to provide habitat for this species. However, as shown in Table 3.4-3, various other covered activities have the potential to permanently impact about 65.5 acres and tamarisk scrub habitat in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. Installation of seepage recovery systems along the East Highline Canal in particular, have the potential to impact habitat for gilded flicker. Depending on the plant species composition of the areas impacted, the loss of tamarisk scrub habitat could reduce foraging and/or nesting opportunities for gilded flicker. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction. Because of the low level of use of the HCP area by gilded flicker, and generally poor quality of tamarisk scrub habitat as habitat for this species, no adverse population-level effects would be expected.

The Tamarisk Scrub Habitat Conservation Strategy would minimize and mitigate impacts to gilded flickers in the event that they occur in the HCP area. Some potential for take of gilded flickers is associated with construction activities that could destroy a nest if an occupied nest tree is removed. Under the Tamarisk Scrub Habitat Conservation Strategy, IID will survey areas that would be disturbed during construction to determine if any covered species, including gilded flickers, are breeding in habitat that would be disturbed. Removal of habitat will be avoided until after the breeding season and native tree habitat created or acquired, and preserved to compensate for tamarisk scrub habitat that is permanently lost.

The creation or long-term preservation of native tree habitat would contribute to maintaining or increasing the availability of suitable nesting conditions for gilded flickers if located in areas of limited human activity. Additional nesting habitat could be gained if native tree habitat is created or acquired, and preserved as part of the Salton Sea Habitat Conservation Strategy. Given the limited potential for take of gilded flicker as a result of covered activities, the beneficial aspects of the Tamarisk Scrub Habitat Conservation Strategy would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of this species.

### 3.4.6.7 Western Yellow-Billed Cuckoo

Yellow-billed cuckoos are rare in the HCP area and occur only as accidentals. The species has been observed on two occasions at the Salton Sea NWR, but has not been reported in the Imperial Valley. On one occasion, a single individual was observed along the AAC. The absence of yellow-billed cuckoos from the HCP area is expected because riparian cottonwood-willow habitat that yellow-billed cuckoos require does not exist in the HCP area. On the rare occasion that it does occur in the HCP area, it could use tamarisk as the only available tree or shrub habitat. Because of the low level of use of the HCP area by yellow-billed cuckoos, the potential for take is very low. Nonetheless, over the term of the permit, it is possible for a covered activity to directly or indirectly cause take of a yellow-billed cuckoo.

Drain maintenance activities would not be expected to impact yellow-billed cuckoo because, as a result of regular maintenance, trees do not grow large enough to attract this species. However, as shown in Table 3.4-3, various other covered activities have the potential to permanently impact about 65.5 acres and tamarisk scrub habitat in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. Installation of seepage recovery systems along the East Highline Canal in particular, have the potential to impact habitat for yellow-billed cuckoo. The permanent loss of tamarisk scrub habitat could reduce foraging and cover opportunities for yellow-billed cuckoo. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction. Because of the accidental use of the HCP area by yellow-billed cuckoo, and generally poor quality of tamarisk scrub habitat as habitat for this species, no adverse population-level effects would be expected.

Implementation of the Tamarisk Scrub Habitat Conservation Strategy would be expected to maintain or improve habitat value for yellow-billed cuckoo in the HCP area. Native tree habitat would be created or acquired, and preserved to replace any tamarisk scrub habitat that would be permanently lost as a result of the construction activities (See Tree Habitat–1 and –2). As part of the Salton Sea Habitat Conservation Strategy, native tree habitat also would be created or acquired, and preserved if a net loss of tamarisk scrub habitat occurs within the shoreline strand or adjacent wetlands. Consisting of native plant species, the created or acquired habitat would provide better habitat quality for yellow-billed cuckoo than the tamarisk that would be lost. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would offset any reduction in habitat value for yellow-billed cuckoo resulting from reductions in the amount of tamarisk scrub habitat thus mitigating the impact of take potentially resulting from changes in habitat.

Implementation of the HCP measures would minimize and mitigate the impact of take of yellow-billed cuckoo that could result from the covered activities and would not jeopardize the continued existence of this species. Based on the accidental use of the HCP area by yellow-billed cuckoo, and the low quality of tamarisk as habitat for this species, the potential for take and the magnitude of take of yellow-billed cuckoo as a result of the covered activities is very low. Creation or acquisition and long-term protection of native tree habitat would make high-quality habitat for yellow-billed cuckoo available in perpetuity. This long-term protection of native habitat would ensure the availability of habitat in the HCP area for yellow-billed cuckoo of at least equivalent value (considering both acreage

and quality) as the tamarisk scrub habitat impacted by the covered activities, thus mitigating take of yellow-billed cuckoo that could result from reductions in the amount of tamarisk scrub habitat. With the compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of yellow-billed cuckoo.

### 3.4.6.8 White-Tailed Kite

White-tailed kites can occur in the HCP area throughout the year. Their current breeding status in the HCP area is uncertain. They have bred in the HCP area previously, but have not been verified to breed there recently. White-tailed kites typically forage in agricultural fields and are known to roost in Bermuda grass fields. Nests are located in trees. If white-tailed kites currently nest in the HCP area, they are most likely to use landscape trees or eucalyptus trees bordering agricultural fields as there are few other trees available in the Imperial Valley. Use of tamarisk is probably minimal because it does not provide a structure conducive to perching or nesting by raptors. Where other tree species occur within tamarisk scrub habitat (e.g., seepage communities along the East Highline Canal), white-tailed kites could find suitable nesting habitat.

Drain maintenance activities would not be expected to impact white-tailed kites because, as a result of regular maintenance trees do not grow large enough to provide habitat for this species. However, as shown in Table 3.4-3, various other covered activities have the potential to permanently impact about 65.5 acres and tamarisk scrub habitat in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. Installation of subsurface recovery systems along the East Highline Canal in particular, have the potential to impact habitat for white-tailed kites. Depending on the plant species composition of the areas impacted, the loss of tamarisk scrub habitat could reduce nesting opportunities for white-tailed kites. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of removal of this habitat. Although not known to currently nest in the HCP area, white-tailed kites have nested in the HCP area in the past. Potentially, white-tailed kites could nest in the HCP area in the future, and the seepage communities adjacent to the East Highline Canal could support suitable trees for nesting. If kites nest in the seepage communities in the future, installation of subsurface recovery systems could result in take of white-tailed kites. Because they are not known to currently nest in the HCP, the probability and the level of take potentially occurring through this mechanism is low.

The potential for white-tailed kites to be disturbed or injured as a result of the covered activities is also low because this species is most likely to be found in association with trees in urban areas or along agricultural fields. Few, if any, of the covered activities would be conducted in areas supporting potentially suitable nest trees with the exception of installation of subsurface recovery systems described above. Nonetheless, some potential for disturbance of white-tailed kites is associated with construction activities that could occur in the vicinity of an active nest. Under the Tamarisk Scrub Habitat Conservation Strategy, IID will survey areas that would be disturbed during construction to determine if any covered species, including white-tailed kites, are breeding in habitat that would be disturbed. Removal of habitat will be avoided until after the breeding season and native tree habitat

created to compensate for tamarisk scrub or cottonwood-willow habitat that is permanently lost.

The Tamarisk Scrub Habitat Conservation Strategy could benefit white-tailed kites. Foraging and roosting habitat is abundant in the HCP area, but few trees are available for nesting. The native tree habitat that would be created or acquired, and preserved under the Tamarisk Scrub Habitat Conservation Strategy could provide suitable nest and perch locations for white-tailed kites if located in proximity to suitable foraging habitat. White-tailed kites will readily use lone trees adjacent to agricultural fields for nesting. Although they have not been reported to nest in the HCP area in recent years, white-tailed kites previously nested in the area. The native tree habitat created or acquired, and preserved under Tamarisk Scrub Habitat Conservation Strategy and potentially the Salton Sea Habitat Conservation Strategy could increase the likelihood that this species would breed in the HCP area again. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would offset a reduction in habitat value for resulting from reductions in the amount of tamarisk scrub thus mitigating the impact of take potentially resulting from changes in habitat.

Implementation of the HCP measures would minimize and mitigate the impact of take of white-tailed kites that could result from the covered activities and would not jeopardize the continued existence of this species. Creation or acquisition and long-term protection of native tree habitat would provide high-quality habitat for white-tailed kites and, given the small amount of potentially suitable nesting habitat for this species, would benefit the species by increasing nesting opportunities over the long term. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of white-tailed kites.

#### 3.4.6.9 Summer Tanager

Summer tanagers are rare in the HCP area, but have been reported in the HCP area in summer and winter. Although they have not been reported to breed in the HCP area, reports of summer tanagers in the HCP area during the summer suggest that the species could become a breeding species in the future. Summer tanagers are typically associated with mature cottonwood-willow riparian forest habitat; however, they are known to use areas supporting large tamarisk. In the HCP area they could use tamarisk along the drains, rivers, Salton Sea, and seepage communities adjacent to the East Highline Canal.

Summer tanagers could be directly or indirectly taken as a result of several covered activities. If summer tanagers use vegetation in the drains or rivers, drain and river maintenance activities could flush summer tanagers which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed they are subject to predation. On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. Much of this vegetation could be used by summer tanagers. The New and Alamo rivers are dredged about every four years which similarly could affect summer tanagers. Currently, summer tanagers are rare in the HCP area. Considering that only 20 percent of the drainage system is maintained each year, and dredging of the river mouths is only conducted about once every four years, the likelihood of these activities coinciding with the presence of a summer

tanager and thereby resulting in take from displacement of birds is low. In the event that summer tanagers start breeding in the HCP area over the 75-year permit term, drain maintenance activities could result in the direct destruction of nests.

Drain maintenance activities and several other covered activities also have the potential to result in take of summer tanagers through temporary or permanent reductions in the amount of tamarisk scrub habitat. As shown in Table 3.4-3, various maintenance and water conservation activities have the potential to temporarily impact about 43.2 acres of tamarisk scrub habitat and permanently impact about 65.5 acres in the Imperial Valley. Up to 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. In addition, a reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. These reductions in tamarisk scrub habitat could reduce foraging opportunities and cover for summer tanagers. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), low level of use of the HCP area by summer tanagers and poor quality of tamarisk as habitat for summer tanagers, no adverse population-level effects would be expected.

Various construction activities anticipated by IID have the potential to remove tamarisk scrub habitat that could be used by summer tanagers. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). Because of the abundance of tamarisk scrub habitat in the HCP area (more than 7,500 acres) and small amount of habitat that would be permanently impacted by construction activities (about 65 acres in the Imperial Valley and up to 100 acres adjacent to the AAC and other canals adjacent to desert habitat) over the term of the permit, the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal. If summer tanagers nest in the HCP area over the term of the permit, construction activities could result in the destruction of nests during habitat removal. Tamarisk is poor quality habitat for summer tanagers and the HCP area is outside this species' currently known breeding range. As such, the number of summer tanagers potentially breeding in the HCP area over the term of the permit would be expected to be low. Given this low level of expected use and the small amount of habitat that would be impacted, the amount of take attributable to nest destruction during construction activities would be very low.

Summer tanagers could benefit from the creation or long-term protection of native tree habitat under the Tamarisk Scrub Habitat Conservation Strategy and potentially the Salton Sea Habitat Conservation Strategy. Implementation of the Tamarisk Scrub Habitat Conservation Strategy would be expected to maintain or improve habitat value for summer tanagers in the HCP area. Native tree habitat would be created or acquired, and preserved to replace any tamarisk scrub habitat that would be permanently lost as a result of the construction activities (see Tree Habitat–1 and –2). As part of the Salton Sea Habitat Conservation Strategy, native tree habitat also would be created or acquired, and preserved if a net loss of tamarisk scrub habitat occurs within the shoreline strand or adjacent wetlands. The native tree habitat would consist of cottonwoods, willows, mesquite, and other plant species typical of southwestern riparian areas. Native riparian habitat is

preferred by summer tanagers and the decline in this habitat type is believed to have been the primary cause of declines in this species. At least the current level of use of the HCP area by summer tanagers would be expected to continue but use could increase over the tern of the permit if breeding pairs were attracted to native tree habitat created or acquired and preserved under the Tamarisk Scrub Habitat Conservation Strategy.

The Tamarisk Scrub Habitat Conservation Strategy also includes measures to minimize injury or disturbance to summer tanagers if construction activities would affect habitat that summer tanagers use for nesting. Under the Tamarisk Scrub Habitat Conservation Strategy, IID will survey areas that would be disturbed during construction to determine if any covered species, including summer tanagers, are breeding in habitat that would be disturbed. If summer tanagers are found likely to be breeding in affected habitat, removal of habitat will be avoided until after the breeding season. Native tree habitat also will be created to compensate for tamarisk scrub or cottonwood-willow habitat that is permanently lost. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of summer tanager.

#### 3.4.6.10 Vermilion Flycatcher

Vermilion flycatchers are known to occur within the HCP area, but are considered rare (Shuford et al. 1999). Although the species is thought to have bred in the HCP area at one time, no nesting populations currently are known. Historically, vermilion flycatchers were associated with native riparian plant communities. However, unlike some other riparian habitat associates, vermilion flycatchers have come to exploit nonnative habitats such as common reed and tamarisk supported in agricultural drains.

Vermilion flycatchers could be directly or indirectly taken as a result of several covered activities. This species has been reported using vegetation in the drains. Drain maintenance activities could flush vermilion flycatchers from drain vegetation which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation they are subject to predation. On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. Much of this vegetation could be used by vermilion flycatchers. The New and Alamo rivers are dredged about every four years which similarly could affect summer tanagers. Currently, vermilion flycatchers are rare in the HCP area. Considering that only 20 percent of the drainage system is maintained each year, and dredging of the river mouths is only conducted about once every four years, the likelihood of these activities coinciding with the presence of a vermilion flycatcher and thereby resulting in take from displacement of birds is low. In the event that vermilion flycatchers start breeding in the HCP area over the 75-year permit term, drain maintenance activities could result in the direct destruction of nests.

Drain maintenance activities and several other covered activities also have the potential to result in take of vermilion flycatchers through temporary or permanent reductions in the amount of tamarisk scrub habitat. As shown in Table 3.4-3, various maintenance and water conservation activities have the potential to temporarily impact about 43.2 acres of tamarisk scrub habitat and permanently impact about 65.5 acres in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction

activities along the AAC or other canals adjacent to desert habitat. In addition, a reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. These reductions in tamarisk scrub habitat could reduce foraging opportunities and cover for vermilion flycatchers. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), low level of use of the HCP area by vermilion flycatchers and poor quality of tamarisk as habitat for vermilion flycatchers, overall population-level effects would not be expected.

Various construction activities anticipated by IID have the potential to remove tamarisk scrub habitat that could be used by vermilion flycatchers. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). Because of the abundance of tamarisk scrub habitat in the HCP area (more than 7,500 acres) and small amount of habitat that would be permanently impacted by construction activities over the term of the permit, the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal. If vermilion flycatchers nest in the HCP area over the term of the permit, construction activities could result in the destruction of nests during habitat removal. Tamarisk is poor quality habitat for vermilion flycatchers and the species is not known to currently breed in the HCP area. As such, the number of vermilion flycatchers potentially breeding in the HCP area over the term of the permit would be expected to be low. Given this low level of expected use and the small amount of habitat that would be impacted, the amount of take attributable to nest destruction during construction activities would be very low.

Implementation of the Tamarisk Scrub Habitat Conservation Strategy would be expected to maintain or improve habitat value for vermilion flycatchers in the HCP area. Native tree habitat would be created or acquired, and preserved to replace any tamarisk scrub habitat that would be permanently lost as a result of the construction activities (see Tree Habitat–1 and –2). As part of the Salton Sea Habitat Conservation Strategy, native tree habitat also would be created or acquired, and preserved if a net loss of tamarisk scrub habitat occurs within the shoreline strand or adjacent wetlands. Consisting of native plant species, the created or acquired habitat would be expected to provide better habitat quality for vermilion flycatcher than the tamarisk scrub habitat that would be lost. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would offset the reduction in habitat value for vermilion flycatcher resulting from reductions in the amount of tamarisk scrub, thus mitigating the impact of take potentially resulting from changes in habitat.

Although vermilion flycatchers currently are not known to breed in the HCP area, IID will implement measures to avoid and minimize impacts of construction activities on vermilion flycatcher that might breed in the HCP area in the future. Under Tree Habitat–3 and Drain Habitat–3, prior to conducting scheduled construction activities IID will survey construction areas and if covered species are found breeding in impacted areas, IID will schedule construction to occur outside the breeding season. With this measure, IID will minimize the potential for construction activities to destroy nests.

Implementation of the HCP measures would minimize and mitigate the impact of take of vermilion flycatcher that could result from the covered activities and would not jeopardize

the continued existence of this species. Based on: (1) the low level of use of the HCP area by vermilion flycatcher, (2) the low quality of tamarisk as habitat for this species, (3) the abundance of potential habitat in and around the HCP area, and (4) implementation of measures to minimize take of vermilion flycatchers, the potential for take and the magnitude of take of vermilion flycatcher as a result of the covered activities is low. Creation or acquisition and long-term protection of native tree habitat would provide high-quality habitat for vermilion flycatcher in perpetuity. This long-term protection of native habitat would ensure the availability of migratory stopover and wintering habitat as well as nesting opportunities for vermilion flycatcher of at least equivalent value (considering both acreage and quality) as the tamarisk scrub habitat impacted by the covered activities, thus mitigating take of vermilion flycatcher that could result from reductions in the amount of tamarisk scrub habitat. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of vermilion flycatcher.

#### 3.4.6.11 Harris' Hawk

Historically Harris' hawks bred at the south end of the Salton Sea, but have not been reported in the HCP area in recent years. Harris' hawks occur in desert scrub dominated by saguaro, palo verde, and ironwood; cottonwood-mesquite forests; and semi-desert prairies. Saguaro cacti, palo verde, mesquite, and riparian trees, especially cottonwoods, are used as nest sites. Harris' hawks are somewhat tolerant of human activity and will use trees in urban settings as well as utility poles. They are not known to use tamarisk. Where other tree species occur within tamarisk scrub habitat (e.g., seepage communities along the East Highline Canal), Harris' hawk could find suitable nesting habitat.

Drain maintenance activities would not be expected to impact Harris' hawk because, as a result of regular maintenance trees do not grow large enough to provide habitat for this species. However, as shown in Table 3.4-3, various other covered activities have the potential to permanently impact about 65.5 acres of tamarisk scrub habitat in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. Installation of subsurface recovery systems along the East Highline Canal in particular, have the potential to impact habitat for Harris' hawk. Depending on the plant species composition of the areas impacted, the loss of tamarisk scrub habitat could reduce nesting and foraging opportunities for Harris' hawk. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of removal of this habitat.

Although not known to currently nest in the HCP area, Harris' hawk have nested in the HCP area in the past. Potentially, Harris' hawk could nest in the HCP area in the future, and the seepage communities adjacent to the East Highline Canal could support suitable trees for nesting. If Harris' hawk nested in the seepage communities, installation of subsurface recovery systems could result in take. Because they are not known to currently nest in the HCP, the probability and the level of take potentially occurring through this mechanism is currently low.

A reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. Potentially some of this habitat could be used by Harris' hawk for nesting in the future.

Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), current lack of use of this habitat by Harris hawk the poor quality of tamarisk as habitat for Harris' hawk, no adverse population-level effects would be expected.

The potential for Harris' hawks to be disturbed or injured as a result of the covered activities is also low. Harris' hawks are probably most likely to occur in the HCP area in the seepage community between Drops 3 and 4 on the AAC. This community contains cottonwoods and mesquite that could be used for nesting with adjacent desert scrub, a commonly used habitat for foraging. O&M activities would not affect this community and no construction activities affecting that seepage area are anticipated under this HCP. In addition, under the Tamarisk Scrub Habitat Conservation Strategy and Desert Habitat Conservation Strategy, IID will survey areas that would be disturbed during construction to determine if any covered species, including Harris' hawk, are breeding in habitat that would be disturbed. Removal of habitat will be avoided until after the breeding season and native tree or desert habitat created or acquired to compensate for habitat that is permanently lost. These measures will minimize and mitigate any take of Harris' hawk as a result of construction activities.

The Tamarisk Scrub Habitat Conservation Strategy could benefit Harris' hawk. The native tree habitat that would be created or acquired, and preserved under the Tamarisk Scrub Habitat Conservation Strategy could provide suitable nest and perch locations for Harris' hawk if located in proximity to suitable foraging habitat. Although they have not been reported to nest in the HCP area in recent years, Harris' hawk previously nested in the area. The native tree habitat created or acquired, and preserved under Tamarisk Scrub Habitat Conservation Strategy and potentially the Salton Sea Habitat Conservation Strategy could increase the likelihood that this species would breed in the HCP area again. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would more than offset a reduction in habitat value for resulting from reductions in the amount of tamarisk scrub, thus mitigating the impact of take potentially resulting from changes in habitat. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of Harris' hawk.

#### 3.4.6.12 Crissal Thrasher

The crissal thrasher occupies dense thickets of shrubs or low trees in desert habitats. Mesquite, ironwood, catclaw acacia, and arrowweed willow are preferred vegetation. Crissal thrashers are resident, breeding species in the HCP area and have been reported along the Alamo River and near the towns of Niland and Brawley. Tamarisk represents the primary shrub vegetation available in the HCP area. The extent to which crissal thrasher use tamarisk is uncertain, but invasion of mesquite scrub habitats by tamarisk has been implicated as contributing to declines of this species, suggesting that tamarisk scrub is poor-quality habitat, if it is used at all. Crissal thrasher also could occur in seepage communities adjacent to the East Highline Canal.

Crissal thrasher could be directly or indirectly taken as a result of several covered activities. This species has been reported along the Alamo River and in other locations in the HCP area

and could also use vegetation in the drains. Drain and river maintenance activities could flush crissal thrasher which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation they are subject to predation. IID conducts annual drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. Some of this vegetation could be used by crissal thrasher. The river mouths are dredged about once every four years. Assuming that crissal thrasher currently are breeding in drain vegetation or along the rivers, drain and river maintenance activities could result in the direct destruction of nests.

IID has and will continue to conduct O&M activities of the drains. The vegetation currently supported in the drains is a product of these maintenance activities and current use of this habitat by crissal thrasher occurs in light of these activities. Although water conservation activities could reduce the amount and quality of water in the drains, this potential reduction is not expected to result in a substantial change in the extent and characteristics of vegetation in the drains. Thus, the drains would continue to support habitat for crissal thrasher at a level similar to existing conditions.

Drain maintenance activities and several other covered activities also have the potential to result in take of crissal thrasher through temporary or permanent reductions in the amount of tamarisk scrub habitat. As shown in Table 3.4-3, various maintenance and water conservation activities have the potential to temporarily impact about 43.2 acres of tamarisk scrub habitat and permanently impact about 65.5 acres in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. In addition, a reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. These reductions in tamarisk scrub habitat could reduce foraging, nesting and cover opportunities for crissal thrasher. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), no adverse population-level effects would be expected.

Various construction activities anticipated by IID have the potential to remove tamarisk scrub habitat that could be used by crissal thrasher. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). Because of the abundance of tamarisk scrub habitat in the HCP area (over 7,500 acres) and small amount of habitat that would be permanently impacted by construction activities over the term of the permit, the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal. Assuming crissal thrasher nest in the HCP area, construction activities could result in the destruction of nests during habitat removal.

Implementation of the Tamarisk Scrub Habitat Conservation Strategy would be expected to maintain or improve habitat value for crissal thrasher in the HCP area. Native tree habitat would be created or acquired, and preserved to replace any tamarisk scrub habitat that would be permanently lost as a result of the construction activities (see Tree Habitat –1 and –2). As part of the Salton Sea Habitat Conservation Strategy, native tree habitat also would be created or acquired, and preserved if a net loss of tamarisk scrub habitat occurs within the shoreline strand or adjacent wetlands. Consisting of native plant species, the created or acquired habitat

would be expected to provide better habitat quality for crissal thrasher than the tamarisk that would be lost. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would offset the reduction in habitat value for crissal thrasher resulting from reductions in the amount of tamarisk scrub thus mitigating the impact of take potentially resulting from changes in habitat.

IID will implement measures to avoid and minimize impacts of construction activities on nesting by crissal thrasher. Under Tree Habitat–3, Drain Habitat–3 and Desert Habitat–3, prior to conducting scheduled construction activities IID will survey construction areas, and if covered species are found breeding in impacted areas, IID will schedule construction to occur outside the breeding season. With this measure, IID will minimize the potential for construction activities to destroy nests.

The Imperial Valley is composed of highly modified habitats. Crissal thrashers apparently have adapted to this highly modified environment as evidenced by their persistence and continued breeding in the Imperial Valley. Little change in the extent or availability of tamarisk is expected with implementation of the HCP and the habitat conditions of the Imperial Valley would remain largely the same as existing conditions. As such, crissal thrasher would be expected to persist at levels similar to existing levels.

Implementation of the HCP measures would minimize and mitigate the impact of take of crissal thrasher that could result from the covered activities and would not jeopardize the continued existence of this species. Based on: (1) abundance of tamarisk scrub habitat in the HCP area, (2) creation/acquisition and protection of higher quality habitat to offset habitat reductions, and (3) implementation of measures to minimize take of crissal thrasher, the potential for take and the magnitude of take of crissal thrasher as a result of the covered activities is low. Creation or acquisition and long-term protection of native tree habitat would provide high-quality habitat for crissal thrasher in perpetuity. This long-term protection of native habitat would ensure the availability of habitat for crissal thrasher of at least equivalent value (considering both acreage and quality) as the tamarisk scrub habitat impacted by the covered activities, thus mitigating take of crissal thrasher that could result from reductions in the amount of tamarisk scrub habitat. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of crissal thrasher.

#### 3.4.6.13 Bank Swallow

Bank swallows are casual visitors to the HCP area, potentially occurring in the HCP area as migrants during the spring and fall. For foraging, they are not strongly associated with any particular habitat type, although they often forage near water where insects are abundant. The covered activities are unlikely to adversely affect bank swallows because of the swallow's rare occurrence in the HCP area and broad habitat use for foraging. However, a few individuals could be taken because of changes in foraging habitat availability or quality potentially resulting from permanent or temporary reductions in drain vegetation (see Section 3.5.2.2), permanent or temporary reductions in tamarisk scrub habitat (see Section 3.4.2), or changes in the composition and amount of agricultural field habitat (see Section 3.8.2).

The Tamarisk Scrub Habitat and Salton Sea Conservation Strategies would contribute to mitigating the impact of any take of bank swallows that could result from the covered activities. Under the these two strategies, native tree habitat would be created or acquired and

protected over the long-term to offset changes in habitat value resulting from reductions in tamarisk scrub (see Sections 3.3.4.2 and 3.4.5). By supporting more abundant and diverse insect populations than tamarisk scrub, native tree habitat would provide higher quality foraging opportunities for bank swallow. The Agricultural Field Habitat (see Section 3.8.6.4) and Drain Habitat (see Section 3.5.6.7) Conservation Strategies would also contribute to mitigating impacts to bank swallow that could result from the covered activities.

### 3.4.6.14 Elf Owl

The elf owl population in California has declined to low levels, such that it currently is only known from a few locations along the LCR and some isolated locations in Riverside County. Given the low population size and limited distribution, it is very unlikely that elf owls would occur in the HCP area. Thus, the potential for take of elf owls is very low.

Seepage communities along the AAC are the most likely places where elf owls would occur in the HCP area, given the AAC's closer proximity to the LCR than the Imperial Valley and the presence of adjacent desert scrub habitat. For nesting, elf owls appear to prefer forest habitat bordering desert habitat, conditions that exist in this seepage community. No construction activities affecting that seepage area are anticipated under this HCP.

The seepage communities adjacent to the East Highline Canal constitute other potential habitat for elf owl. Installation of subsurface recovery systems would remove about 43 acres of vegetation, some of which could provide habitat for elf owl. The primary concern for elf owls regarding installation of subsurface recovery systems would be disturbance of nesting birds or removal of a nest site. Elf owls also rely on tall shrubs and trees as perch sites from which to forage. Removal of these features could adversely affect elf owls and potentially result in take by reducing foraging efficiency. Although these mechanisms could conceivably result in take of an individual elf owl, the likelihood of a take resulting from installation of subsurface recovery systems and the level of take potentially occurring is considered to be very low because this species is rare in the HCP area and the available habitat is of poor quality.

Some potential for take of elf owls is associated with construction activities that could destroy a nest if an occupied nest tree is removed. Under the Tamarisk Scrub Habitat Conservation Strategy, IID will survey areas that would be disturbed during construction to determine if any covered species, including elf owls, are breeding in habitat that would be disturbed. Removal of habitat will be avoided until after the breeding season and native tree habitat created or acquired, and preserved to compensate for tamarisk scrub habitat that is permanently lost. These measures will minimize and mitigate any take of elf owls as a result of construction activities.

The creation or long-term preservation of native tree habitat under the Tamarisk Scrub Habitat Conservation Strategy could contribute to maintaining or increasing the availability of suitable nesting conditions for elf owls. Additional nesting habitat could be gained if native tree habitat is created or acquired, and preserved as part of the Salton Sea Habitat Conservation Strategy. Given the limited potential for take of elf owl as a result of covered activities, the beneficial aspects of the Tamarisk Scrub Habitat Conservation Strategy would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of this species.

### 3.4.6.15 Brown-Crested Flycatcher

Brown-crested flycatchers are most numerous in riparian groves of cottonwood, mesquite, and willow, which afford suitable nest sites, but often forage in adjacent desert scrub or tamarisk (Garrett and Dunn 1981). In the HCP area, brown-crested flycatchers have been observed along the AAC in seepage communities and the northern shoreline of the Salton Sea. Given its apparent ability to use tamarisk for foraging, brown-crested flycatchers could occur throughout much of the HCP area. Brown-crested flycatchers are secondary cavity nesters. As such, breeding by this species in the HCP area is limited to the few areas supporting trees that are suitable for woodpeckers. Tamarisk is not suitable for woodpeckers and potentially suitable trees are principally landscape trees or where other tree species occur within tamarisk scrub habitat (e.g., seepage communities along the East Highline Canal or AAC).

Brown-crested flycatchers could be directly or indirectly taken as a result of several covered activities. Although this species has not been reported using vegetation in the drains, its use of tamarisk scrub elsewhere in the HCP area indicates that it could forage in vegetation in the drains as well. On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. Only a portion of this vegetation would be tamarisk (estimated 43 acres) and be potential habitat for this species. The river mouths are dredged about every four years. Drain and river maintenance activities could flush brown-crested flycatchers that are foraging or roosting in drain vegetation which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation such that they are subject to predation. This species is a secondary cavity nester and because drain vegetation is not suitable for primary cavity nesters, suitable nesting habitat for brown-crested flycatchers is not supported in the drains.

Drain maintenance activities and several other covered activities also have the potential to result in take of brown-crested flycatcher through temporary or permanent reductions in the amount of tamarisk scrub habitat. As shown in Table 3.4-3, various maintenance and water conservation activities have the potential to temporarily impact about 43.2 acres of tamarisk scrub habitat and permanently impact about 65.5 acres in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. In addition, a reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. These reductions in tamarisk scrub habitat could reduce foraging opportunities for brown-crested flycatcher. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), overall population-level effects would be negligible.

Various construction activities anticipated by IID have the potential to remove tamarisk scrub habitat that could be used by brown-crested flycatcher. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). Because of the abundance of tamarisk scrub habitat in the HCP area (more than 7,500 acres) and small amount of habitat that would be permanently impacted by construction activities over the term of the permit,

the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal.

Construction activities could result in the destruction of nests of brown-crested flycatcher during habitat removal. Installation of seepage recovery systems along the East Highline Canal in particular, has the greatest potential to cause destruction of nests of brown-crested flycatcher because these areas have the greatest likelihood to support woodpeckers on which brown-crested flycatchers depend to create nesting cavities (see for example discussion of Gila woodpecker and gilded flicker). Under the Tamarisk Scrub Habitat and Desert Habitat Conservation Strategies, IID will survey areas that would be disturbed during construction to determine if any covered species, including brown-crested flycatcher, are breeding in habitat that would be disturbed. Removal of habitat will be avoided until after the breeding season and native tree habitat created to compensate for tamarisk scrub or cottonwood-willow habitat that is permanently lost. These measures will minimize and mitigate any take of brown-crested flycatcher as a result of construction activities.

Implementation of the Tamarisk Scrub Habitat Conservation Strategy could benefit brown-crested flycatcher. As a secondary cavity nester, brown-crested flycatchers depend on woodpeckers to create nesting cavities. Trees suitable for excavating nesting cavities are limited in the HCP area. Under the Tamarisk Scrub Habitat Conservation Strategy, native tree habitat would be created/acquired, and preserved in perpetuity. Trees such as cottonwoods or mesquite would be an important component of this habitat. Given the limited availability of trees of suitable size and wood characteristics in the HCP area, the creation and/or long-term preservation of native tree habitat would contribute to maintaining or increasing the availability of nest trees suitable for woodpeckers over the term of the permit, which could increase nesting opportunities for brown-crested flycatchers. Brown-crested flycatchers would further benefit if native tree habitat was created or acquired, and preserved as part of the Salton Sea Habitat Conservation Strategy. Given the limited potential for take of brown-crested flycatcher as a result of covered activities, the beneficial aspects of the Tamarisk Scrub Habitat Conservation Strategy would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of this species.

### 3.4.6.16 Yellow-Breasted Chat

Yellow-breasted chats are occasional migrants and summer residents in the HCP area. Preferred habitat for the chat consists of cottonwood-willow riparian habitats, in which they primarily use the willow scrub component. This type of habitat is rare in the HCP area. However, yellow-breasted chats have been reported to use tamarisk scrub habitat and to breed in tamarisk scrub habitats around the Salton Sea.

Yellow-breasted chats could be directly or indirectly taken as a result of several covered activities. Although this species has not been reported using vegetation in the drains, its use of tamarisk scrub elsewhere in the HCP area indicates that it could use vegetation in the drains as well, including for nesting. Drain maintenance activities could flush yellow-breasted chats from drain vegetation which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation they are subject to predation. Nests also could be destroyed by drain

maintenance activities. On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. Much of this vegetation could be used by yellow-breasted chats. Currently, yellow-breasted chats are only known to occur in the HCP area during the summer and as occasional migrants. With 80 percent of the drain vegetation undisturbed each year and considering IID would be actively cleaning only a fraction of the 20 percent of the drainage system that is maintained each year during the period when yellow-breasted chats are in the HCP area, the potential for take and the level of take resulting from displacement of birds by drain maintenance activities is low.

The drains would continue to support tamarisk that could be used by yellow-breasted chats. The tamarisk currently in the drains persists under IID's drain maintenance activities. As these activities would continue, tamarisk would remain available in the drains as potential habitat for yellow-breasted chats. Although water conservation activities could reduce the amount and quality of water in the drains, this potential reduction is not expected to result in a substantial change in the extent and characteristics of vegetation in the drains. Thus, the drains would continue to support habitat for yellow-breasted chats at a level similar to existing conditions.

Drain maintenance activities and several other covered activities also have the potential to result in take of yellow-breasted chats through temporary or permanent reductions in the amount of tamarisk scrub habitat. As shown in Table 3.4-3, various maintenance and water conservation activities have the potential to temporarily impact about 43.2 acres of tamarisk scrub habitat and permanently impact about 65.5 acres in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. In addition, a reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. These reductions in tamarisk scrub habitat could reduce foraging and nesting opportunities for yellow-breasted chats. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), overall population-level effects would be negligible.

Various construction activities anticipated by IID have the potential to remove tamarisk scrub habitat that could be used by yellow-breasted chat. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). Because of the abundance of tamarisk scrub habitat in the HCP area (more than 7,500 acres) and small amount of habitat that would be permanently impacted by construction activities over the term of the permit, the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal. Construction activities could result in the destruction of nests of yellow-breasted chats during habitat removal. With the small amount of habitat that would be impacted and considering that tamarisk is poor quality habitat for yellow-breasted chats, the amount of take attributable to nest destruction during construction activities would be low.

Implementation of the Tamarisk Scrub Habitat Conservation Strategy would be expected to maintain or improve habitat value for yellow-breasted chat in the HCP area. Native tree

habitat would be created or acquired, and preserved to replace any tamarisk scrub habitat that would be permanently lost as a result of the construction activities (see Tree Habitat–1 and –2). As part of the Salton Sea Habitat Conservation Strategy, native tree habitat also would be created or acquired, and preserved if a net loss of tamarisk scrub habitat occurs within the shoreline strand or adjacent wetlands. Consisting of native plant species, the created or acquired habitat would be expected to provide better habitat quality for yellow-breasted chat than the tamarisk that would be lost. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would offset the reduction in habitat value for yellow-breasted chat resulting from reductions in the amount of tamarisk scrub thus mitigating the impact of take potentially resulting from changes in habitat.

IID will implement measures to avoid and minimize impacts of construction activities on yellow-breasted chats breeding in the HCP area. Under Tree Habitat–3 and Drain Habitat–3, prior to conducting scheduled construction activities IID will survey construction areas and if covered species are found breeding in impacted areas, IID will schedule construction to occur outside the breeding season. With this measure, IID will minimize the potential for construction activities to destroy nests.

Implementation of the HCP measures would minimize and mitigate the impact of take of yellow-breasted chat that could result from the covered activities and would not jeopardize the continued existence of this species. Based on: (1) the low quality of tamarisk as habitat for this species, (2) the abundance of potential habitat in and around the HCP area, and (3) implementation of measures to minimize take of chats, the potential for take and the magnitude of take of yellow-breasted chat as a result of the covered activities is low. Creation or acquisition and long-term protection of native tree habitat would provide high-quality habitat for yellow-breasted chat in perpetuity. This long-term protection of native habitat would ensure the availability of migratory stopover habitat and nesting opportunities for yellow-breasted chat of at least equivalent value (considering both acreage and quality) as the tamarisk scrub habitat impacted by the covered activities, thus mitigating take of yellow-breasted chat that could result from reductions in the amount of tamarisk scrub habitat. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of yellow-breasted chat.

### 3.4.6.17 Yellow Warbler

The yellow warbler is a common spring and fall migrant and a rare winter visitor to the Salton Sea area. Small numbers regularly winter in the Imperial Valley, and have been observed near the towns of Niland and Calexico. The species has not been reported to breed in the HCP area but could in the future. Yellow warblers are typically associated with riparian shrub habitats, consisting of willows and young cottonwoods. This type of habitat is largely absent in the HCP area. Agricultural drains support tamarisk as well as dense stands of common reed and yellow warblers have been observed to use these habitats.

Yellow warblers could be directly or indirectly taken as a result of several covered activities. This species has been reported using vegetation in the drains. Drain maintenance activities could flush yellow warblers from drain vegetation which could constitute take as

harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation they are subject to predation.

On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. Much of this vegetation could be used by yellow warblers. Currently, yellow warblers are only known to occur in the HCP area as fall and spring migrants and rare winter visitors. With 80 percent of the drain vegetation undisturbed each year and considering IID would be actively cleaning only a fraction of the 20 percent of the drainage system that is maintained each year during the period when yellow warblers are in the HCP area, the potential for take and the level of take resulting from displacement of birds by drain maintenance activities is low. In the event that yellow warblers currently are breeding in drain vegetation in the HCP area or start breeding in the HCP area over the 75-year permit term, drain maintenance activities could result in the direct destruction of nests.

IID has and will continue to conduct O&M activities of the drains. The vegetation currently supported in the drains is a product of these maintenance activities and current use of this habitat by yellow warblers occurs in light of these activities. Although water conservation activities could reduce the amount and quality of water in the drains, this potential reduction is not expected to result in a substantial change in the extent and characteristics of vegetation in the drains. Thus, the drains would continue to support habitat for yellow warblers at a level similar to existing conditions.

Drain maintenance activities and several other covered activities also have the potential to result in take of yellow warblers through temporary or permanent reductions in the amount of tamarisk scrub habitat. As shown in Table 3.4-3, various maintenance and water conservation activities have the potential to temporarily impact about 43.2 acres of tamarisk scrub habitat and permanently impact about 65.5 acres in the Imperial Valley. Up to 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. In addition, a reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. These reductions in tamarisk scrub habitat could reduce foraging opportunities and cover for yellow warblers. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), low level of use of the HCP area by yellow warblers and poor quality of tamarisk as habitat for yellow warblers, overall population-level effects would not be expected.

Various construction activities anticipated by IID have the potential to remove tamarisk scrub habitat that could be used by yellow warblers. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). Because of the abundance of tamarisk scrub habitat in the HCP area (more than 7,500 acres) and small amount of habitat that would be permanently impacted by construction activities (about 65 acres) over the term of the permit, the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal. If yellow warblers nest in the HCP area over the term of the permit, construction activities could result in the destruction of nests during habitat removal. Tamarisk is poor quality habitat for yellow warblers and the HCP area is outside

this species' currently known breeding range. As such, the number of yellow warblers potentially breeding in the HCP area over the term of the permit would be expected to be low. Given this low level of expected use and the small amount of habitat that would be impacted, the amount of take attributable to nest destruction during construction activities would be very low.

Implementation of the Tamarisk Scrub Habitat Conservation Strategy would be expected to maintain or improve habitat value for yellow warblers in the HCP area. Native tree habitat would be created or acquired, and preserved to replace any tamarisk scrub habitat that would be permanently lost as a result of the construction activities (see Tree Habitat–1 and –2). As part of the Salton Sea Habitat Conservation Strategy, native tree habitat also would be created or acquired, and preserved if a net loss of tamarisk scrub habitat occurs within the shoreline strand or adjacent wetlands. Consisting of native plant species, the created or acquired habitat would be expected to provide better habitat quality for yellow warblers than the tamarisk that would be lost. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would offset the reduction in habitat value for yellow warblers resulting from reductions in the amount of tamarisk scrub thus mitigating the impact of take potentially resulting from changes in habitat.

Although yellow warblers currently are not known to breed in the HCP area, IID will implement measures to avoid and minimize impacts of construction activities on yellow warblers that could breed in the HCP area in the future. Under Tree Habitat–3 and Drain Habitat–3, prior to conducting scheduled construction activities IID will survey construction areas and if covered species are found breeding in impacted areas, IID will schedule construction to occur outside the breeding season. With this measure, IID will minimize the potential for construction activities to destroy nests.

Implementation of the HCP measures would minimize and mitigate the impact of take of yellow warblers that could result from the covered activities and would not jeopardize the continued existence of this species. Based on: (1) the low level of use of the HCP area by yellow warblers, (2) the low quality of tamarisk as habitat for this species, (3) the abundance of potential habitat in and around the HCP area, and (4) implementation of measures to minimize take of yellow warblers, the potential for take and the magnitude of take of yellow warbler as a result of the covered activities is low. Creation or acquisition and long-term protection of native tree habitat would provide high quality habitat for yellow warbler in perpetuity. This long-term protection of native habitat would ensure the availability of migratory stopover and wintering habitat as well as nesting opportunities for yellow warbler of at least equivalent value (considering both acreage and quality) as the tamarisk scrub habitat impacted by the covered activities, thus mitigating take of yellow warbler that could result from reductions in the amount of tamarisk scrub habitat. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of yellow warbler.

### 3.4.6.18 Large-Billed Savannah Sparrow

This subspecies of savannah sparrow is a rare to uncommon postbreeding and winter visitor to the Salton Sea area. It occurs in the HCP area from mid-July through the winter, migrating to the Colorado River Delta and Mexico to breed (Garrett and Dunn, 1981).

Although not currently known to breed in the HCP area it could do so in the future. Large-billed savannah sparrows are known to use only tamarisk scrub near mouths of the New and Alamo Rivers at the Salton Sea (Garrett and Dunn, 1981). Given this association with tamarisk at the Salton Sea, large-billed savannah sparrows also could use tamarisk scrub throughout the HCP area.

Large-billed savannah sparrows could be directly or indirectly taken as a result of several covered activities. Although this species has not been reported using vegetation in the drains, its use of tamarisk scrub elsewhere in the HCP area indicates that it could use vegetation in the drains as well. Drain maintenance activities could flush large-billed savannah sparrows from drain vegetation which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation they are subject to predation. If this species breeds in the HCP area in the future, nests also could be destroyed by drain maintenance activities.

On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. A portion of this vegetation (an estimated 215 acres of tamarisk) could be used by large-billed savannah sparrows. Currently, large-billed savannah sparrows are only known to occur in the HCP area during the late summer and as occasional migrants at other times of the year. With 80 percent of the drain vegetation undisturbed each year, and considering IID would be actively cleaning only a fraction of the 20 percent of the drainage system that is maintained each year during the period when large-billed savannah sparrows are in the HCP area, the potential for take and the level of take resulting from displacement of birds by drain maintenance activities is low. River dredging also could flush birds. The potential for take and the level of take potentially resulting from displacement of birds during river dredging is low, given that this activity is conducted only every four years.

Drain maintenance activities and several other covered activities also have the potential to result in take of large-billed savannah sparrows through temporary or permanent reductions in the amount of tamarisk scrub habitat. As shown in Table 3.4-3, various maintenance and water conservation activities have the potential to temporarily impact about 43.2 acres of tamarisk scrub habitat and permanently impact about 65.5 acres in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. In addition, a reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. These reductions in tamarisk scrub habitat could reduce foraging and nesting opportunities for large-billed savannah sparrows. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), no adverse population-level effects would be expected.

Various construction activities anticipated by IID have the potential to remove tamarisk scrub habitat that could be used by large-billed savannah sparrow. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). Because of the abundance of tamarisk scrub habitat in the HCP area (more than 7,500 acres) and small amount of habitat that would be permanently impacted by construction activities over the term of the permit, the amount of take

potentially occurring from displacement of individuals as habitat is removed would be minimal. Construction activities could result in the destruction of nests of large-billed savannah sparrows during habitat removal. With the small amount of habitat that would be impacted and considering that tamarisk is poor-quality habitat for large-billed savannah sparrows, the amount of take attributable to nest destruction during construction activities would be low.

Implementation of the Tamarisk Scrub Habitat Conservation Strategy would be expected to maintain or improve habitat value for large-billed savannah sparrow in the HCP area. Native tree habitat would be created or acquired, and preserved to replace any tamarisk scrub habitat that would be permanently lost as a result of the construction activities (see Tree Habitat–1 and –2). As part of the Salton Sea Habitat Conservation Strategy, native tree habitat also would be created or acquired, and preserved if a net loss of tamarisk scrub habitat occurs within the shoreline strand or adjacent wetlands. Consisting of native plant species, the created or acquired habitat would be expected to provide better habitat quality for large-billed savannah sparrow than the tamarisk that would be lost. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would offset the reduction in habitat value for large-billed savannah sparrow resulting from reductions in the amount of tamarisk scrub thus mitigating the impact of take potentially resulting from changes in habitat.

IID will implement measures to avoid and minimize impacts of construction activities on large-billed savannah sparrows breeding in the HCP area. Under Tree Habitat–3 and Drain Habitat–3, prior to conducting scheduled construction activities IID will survey construction areas and if covered species are found breeding in impacted areas, IID will schedule construction to occur outside the breeding season. With this measure, IID will minimize the potential for construction activities to destroy nests if this species breeds in the HCP area.

Implementation of the HCP measures would minimize and mitigate the impact of take of large-billed savannah sparrow that could result from the covered activities and would not jeopardize the continued existence of this species. Considering the abundance of potential habitat in and around the HCP area, and implementation of measures to minimize take of savannah sparrows, the potential for take and the magnitude of take of large-billed savannah sparrow as a result of the covered activities is low. Creation or acquisition and long-term protection of native tree habitat would provide high-quality habitat for large-billed savannah sparrow in perpetuity. This long-term protection of native habitat would ensure the availability of post-breeding habitat and nesting opportunities for large-billed savannah sparrow of at least equivalent value (considering both acreage and quality) as the tamarisk scrub habitat impacted by the covered activities, thus mitigating take of large-billed savannah sparrow that could result from reductions in the amount of tamarisk scrub habitat. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of large-billed savannah sparrow.

### 3.4.6.19 Sharp-Shinned Hawk

Sharp-shinned hawks occur in the HCP area as migrants and winter visitors (USFWS, 1997b). Sharp-shinned hawks typically use woodland habitats; they primarily prey on small birds. In the HCP area, woodland habitats are relatively rare and consist mainly of tamarisk scrub along the Salton Sea, the New and Alamo Rivers, and agricultural drains. Sharp-shinned hawks have been observed along larger drains in the Imperial Valley (Hurlbert et al. 1997).

Various covered activities have the potential to permanently impact about 65.5 acres of tamarisk scrub habitat in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of removal of this habitat. A reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. Sharp-shinned hawk could forage in association with this habitat. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction. Because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), current low level of use of the HCP area by sharp-shinned hawk and the poor quality of tamarisk as habitat for this species, no adverse population-level effects would be expected.

The Tamarisk Scrub Habitat Conservation Strategy could benefit sharp-shinned hawk. The native tree habitat that would be created or acquired, and preserved under the Tamarisk Scrub Habitat Conservation Strategy could improve foraging opportunities by providing higher-quality habitat that attracts songbirds on which sharp-shinned hawks prey. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would more than offset a reduction in habitat value for resulting from reductions in the amount of tamarisk scrub thus mitigating the impact of take potentially resulting from changes in habitat. With the compensation for the minimal amount take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of sharp-shinned hawk.

#### 3.4.6.20 Cooper's Hawk

Cooper's hawks currently are known to occur in the HCP area only in the winter (USFWS, 1997b) although they could breed in the HCP area over the term of the permit. Cooper's hawks typically use open woodland habitats where they primarily prey on small birds. In the HCP area, woodland habitats are relatively rare and consist mainly of tamarisk scrub along the Salton Sea, the New and Alamo Rivers, and agricultural drains. Cooper's hawks have been observed along larger drains in the Imperial Valley (Hurlbert et al. 1997).

A number of covered activities have the potential to permanently impact about 65.5 acres and tamarisk scrub habitat in the Imperial Valley. Up to an additional 100 acres of tamarisk scrub habitat could be removed during construction activities along the AAC or other canals adjacent to desert habitat. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of removal of this habitat. In particularly, installation of subsurface recovery systems along the East Highline Canal would reduce tamarisk scrub habitat that could be used by Cooper's hawk for foraging and nesting. Potentially, Cooper's hawk could nest in the HCP area in the future, and the seepage communities adjacent to the East Highline Canal could support suitable trees for nesting. If Cooper's hawk nest in the seepage communities, installation of subsurface recovery systems could result in take. Because of they are not known to currently nest in the HCP, the probability and extent of take potentially occurring through this mechanism is low.

A reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. Potentially some of this habitat could be used by Cooper's hawk for nesting in the

future. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), current lack of use of this habitat by Cooper's hawk the poor quality of tamarisk as habitat for this species, no adverse population-level effects would be expected.

The Tamarisk Scrub Habitat Conservation Strategy could benefit Cooper's hawk. The native tree habitat that would be created or acquired, and preserved under the Tamarisk Scrub Habitat Conservation Strategy could provide suitable nest and perch locations for Cooper's hawk and potentially improve foraging habitat quality by attracting songbirds. The native tree habitat created or acquired, and preserved under Tamarisk Scrub Habitat Conservation Strategy and potentially the Salton Sea Habitat Conservation Strategy could increase the likelihood that this species would breed in the HCP area again. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would more than offset a reduction in habitat value for resulting from reductions in the amount of tamarisk scrub thus mitigating the impact of take potentially resulting from changes in habitat. The Drain Habitat Conservation Strategy also could benefit this species as the 190 to 652 acres of managed marsh habitat could attract a variety of songbirds, on which this species preys. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of Cooper's hawk.

#### 3.4.6.21 Long-Eared Owl

Long-eared owls are occasional winter visitors to the Salton Sea area (USFWS, 1997b). They are not known to breed in the area. Potential habitat for long-eared owls in the HCP area consists mainly of tamarisk scrub habitat along the New and Alamo Rivers, Salton Sea, and agricultural drains. They predominantly prey on small mammals.

Various covered activities have the potential to permanently impact about 65.5 acres of tamarisk scrub habitat. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of removal of this habitat. A reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. Long-eared owls could forage in association with this habitat. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), current low level of use of the HCP area by long-eared owl and the poor quality of tamarisk as habitat for this species, no adverse population-level effects would be expected.

The Tamarisk Scrub Habitat Conservation Strategy could benefit long-eared owl. The native tree habitat that would be created or acquired, and preserved under the Tamarisk Scrub Habitat Conservation Strategy could improve foraging opportunities by providing perch sites and potentially supporting more abundant small mammal populations. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would more than offset a reduction in habitat value for resulting from reductions in the amount of tamarisk scrub thus mitigating the impact of take potentially resulting from changes in habitat. With the compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of long-eared owl.

# 3.5 Drain Habitat Conservation Strategy

## 3.5.1 Amount and Quality of Habitat in the HCP Area

Habitat in the HCP area potentially used by species associated with drain habitat occurs in association with the drainage system, in managed marsh on the state and federal refuges, and on private duck clubs. Species associated with drain habitat also could use seepage areas adjacent to the AAC or East Highline Canal. Seepage areas adjacent to the AAC would not be affected by the covered activities. Potential effects to seepage areas adjacent to the East Highline Canal are addressed under the Tamarisk Scrub Conservation Strategy. The quality and quantity of habitat on the state and federal refuges and on private duck clubs will not be affected by the covered activities. Thus, potential effects to covered species are restricted to habitat in the drains.

For drain-associated species, cattail/bulrush vegetation is preferred and provides the highest quality habitat in the HCP area. Although potentially used, nonnative plants provide poor quality habitat for covered species. Additional information on the habitat preferences of the covered species associated with drain habitat is provided in Appendix A, Species Covered by the HCP.

Drains support an estimated 63 acres of cattail vegetation and 589 acres of other vegetation consisting of tamarisk, common reed, and other plant species (see discussion of drain habitat in Chapter 2). This vegetation has developed and coexists with IID's drain cleaning activities and other maintenance activities. During the HCP term, IID would continue its current drain maintenance practices; thus, the existing type and amount of vegetation supported in the drains would be expected to remain similar to existing conditions but its physical location would move throughout the drains in the HCP area. In conducting drain maintenance, IID only cleans drains when necessary to maintain gravity flow of tilewater from the farm fields into the drains. About one-fifth of the drain system is cleaned annually. Drain cleaning is focused on removing sediment that accumulates in the bottom of the drain. Flow-obstructing vegetation is removed during this process as well but bank vegetation is often retained to maintain bank stability and to control erosion. These practices moderate fluctuations in habitat availability in the drains and reduce the exposure of covered species to disturbance as a result of drain cleaning activities.

In addition to vegetation in the drains, cattail/bulrush vegetation also occurs in the seepage area between Drops 3 and 4 along the AAC and in small patches in some of the seepage areas adjacent to the East Highline Canal. Table 3.5-1 summarizes the amount and location of drain habitat and areas of emergent vegetation in the HCP area.

**TABLE 3.5-1**
Estimated Acreage and Characteristics of Drain Habitat in Drains and Seepage Areas in the IID HCP Area

| Location | Acreage | Characteristics |
|---|---|---|
| Drains | 652 | 63 acres of cattail vegetation |
| | | 589 acres of tamarisk, common reed and other plant species |
| AAC Seepage Areas | 111 | Primarily cattails |

## 3.5.2 Effects of the Covered Activities

The covered activities have the potential to take a covered species via changes in water quality or through changes in the amount of habitat, disturbance, injury or mortality. The following describes the potential effects to covered species from changes in water quality. Habitat changes, disturbance, injury or mortality potentially resulting from the covered activities are addressed collectively following the water quality evaluation.

### 3.5.2.1 Water Quality Effects

System-based and on-farm water conservation activities, in combination, could contribute to increased selenium concentrations in drain water and affect reproductive success of some covered species associated with drain habitat. The potential effect of the water conservation activities on selenium concentrations in drain water and the subsequent potential effects on reproductive success were predicted using the IID Water Conservation Model and mathematical equations that relate selenium concentrations in water to egg concentrations and hatchability as described below.

#### Prediction of Selenium Concentrations

The IID Water Conservation Model was used to predict selenium concentrations (in parts per billion [ppb]) in drain water at specific locations (nodes)[2] in the drainage system over a 12-year period for the following scenarios:

- Conservation of 130 KAFY of on-farm conservation (130 KAFY on-farm)
- Conservation of 230 KAFY of on-farm conservation (230 KAFY on-farm)
- Conservation of 230 KAFY consisting of 130 KAFY from on-farm measures and 100 KAFY from system improvements (130 KAFY on-farm + 100 KAFY system-based)
- Conservation of 300 KAFY consisting of 200 KAFY from on-farm measures and 100 KAFY from system improvements (230 KAFY on-farm + 70 KAFY system-based).

On-farm conservation of 130 KAFY is the lowest level of conservation under the IID/San Diego County Water Authority (SDCWA) water conservation and transfer project. Under the QSA, a minimum of 230 KAFY is to be conserved. The maximum amount of conservation and transfer is 300 KAFY under both agreements. The maximum amount of water conservation that can be achieved using system-based measures is 100 KAFY. Thus, the scenarios reflect the range of water conservation levels (130 KAFY to 300 KAFY) and techniques (up to 100 KAFY system-based measures).

Implementation of various on-farm conservation methods would vary from year to year and cannot be predicted with certainty for each node. Therefore, a number of model runs for each level of conservation were completed and the average selenium concentration at each node over the various runs was computed for use in the analysis of potential toxic effects. The number of miles of drain associated with each node was used to compute summary statistics that express the overall number of miles of drain with waterborne selenium concentrations in the following categories:

| | | | | |
|---|---|---|---|---|
| 0-5 ppb | 5-6 ppb | 6-7 ppb | 7-8 ppb | 8-9 ppb |
| 9-10 ppb | 10-11 ppb | 11-12 ppb | 12-13 ppb | >13 ppb |

[2] In the IID Water Conservation Model, nodes were located at the end of each drain where the drain empties into the New or Alamo River or the Salton Sea.

For both the conversion from waterborne selenium to egg selenium concentrations and the probability of effects on hatchability (described below), the upper end of each concentration category was used (e.g., 5, 6, 7,… ppb). For the category representing greater than 13 ppb of waterborne selenium, the maximum selenium concentration predicted by the model under each conservation level was used. The number of miles associated with each node was converted to number of acres by assuming that the vegetated area along drains averaged 14 feet in width.

$$\text{No. of acres} = (\text{No. of miles} \times 5{,}280 \times 14)/43{,}560$$

### Conversion of Waterborne Selenium to Egg Selenium Concentration

Based on samples of eggs from 18 different pond systems and three non-drainwater reference sites in the San Joaquin Valley (Skorupa et al. unpub. data), there is a very strong correlation between mean waterborne selenium and mean egg concentrations ($r=0.901$, $N=36$, $P<0.01$) with the following regression equation for the relationship as reported by Ohlendorf et al. (1993):

$$\log \text{egg Se } (\mu g/g) = 0.44 + 0.434 \log \text{water Se } (\mu g/l)$$

Based on this relationship, the predicted selenium concentrations in drainwater were converted to selenium concentrations in eggs for black-necked stilt. Black-necked stilt was used because of the extensive data available on this species and because it displays an intermediate level of sensitivity to selenium (Skorupa 1998). The "stilt standard" is considered the appropriate standard for generalized assessments of toxic impacts (Skorupa 1998).

### Probability of Toxic Effects

The probability of effects on the hatchability of eggs was computed from the following logistic equation reported in Skorupa (1998).

$$P(>1 \text{ inviable egg}) = \text{EXP}(-2.327 + 0.0503[\text{selenium conc.}])/\{1 + \text{EXP}(-2.327 + 0.0503[\text{selenium conc.}])\}$$

Although the probability of teratogenic effects (e.g., embryonic deformities) could have been used as a measure of potential impact, egg hatchability was chosen as the response variable for assessing the potential impact of selenium toxicity because of the relative insensitivity of teratogenesis as a response variable. Egg hatchability effects were expressed as the probability of a hen producing a clutch in which at least one egg was inviable (did not hatch). Hatchability effects were corrected for background rates of inviability as described in Skorupa (1998).

### Computation of Affected Acreage

The number of miles (acres) at each selenium concentration and the probability of hatchability effects at that concentration were used to predict the level of potential effect at each level of water conservation. The probability of hatchability effects in each category of waterborne selenium concentration was multiplied by the number of miles (acres) in each category as predicted by the water quality model and summed over all categories to produce an estimate of the overall number of miles (acres) of drain habitat that would be necessary to offset potential selenium effects.

Only a portion of the drainage system is vegetated and covered species associated with drain habitat primarily use vegetated areas. Some of the covered species (e.g., white-faced ibis and long-billed curlew) forage occasionally in unvegetated portions of the drains. However, these species primarily forage in other habitats (e.g., agricultural fields or on the

state and federal refuges) such that their exposure to selenium in the drains is sporadic. Selenium is metabolized by birds when exposed through their diet, and losses from tissue begin within a few weeks following exposure if not continuously resupplied through elevated dietary concentrations of selenium. As a result, occasional use of unvegetated portions of the drains would not be expected to result in accumulation of selenium to levels that would compromise the reproductive success of the covered species. Therefore, the analysis of the potential effects of increased selenium on covered species was restricted to vegetated portions of the drains, and the maximum effects value was adjusted by the proportion of the drainage system that is vegetated. Currently, this proportion is estimated to be 0.26. This conversion was used to determine the number of acres of additional vegetated drain habitat needed to offset potential selenium effects attributable to the water conservation and transfer program.

The estimated number of additional vegetated drain acres necessary to offset the potential effects (reduced hatchability) of increased selenium concentrations in the drains under each alternative are presented in Table 3.5-2. Hatchability effects are presented at the level of the clutch (or hen) rather than at the level of an individual egg. Hens that are affected may still produce viable eggs, but this analysis assumes that the entire clutch is lost, making the estimate of overall effect a conservative measure of potential impacts.

**TABLE 3.5-2**
Estimated Number of Additional Vegetated Acres Necessary to Offset Potential Selenium Effects on Hatchability Associated With Varying Water Conservation Amounts and Techniques

| | | | Acres of Additional Drain Habitat Needed to Offset Effect | | | |
|---|---|---|---|---|---|---|
| **Maximum Water Se conc. (µg/L)** | **Egg Se conc. (µg/g)** | **Probability of >1 inviable eggs in clutch (Corrected)** | **130 KAFY on-farm** | **230 KAFY on-farm** | **130 KAFY on-farm + 100 KAFY system-based** | **200 KAFY on-farm + 100 KAFY system-based** |
| 5 | 5.538 | 0.02767 | 1.48 | 1.14 | 1.00 | 0.83 |
| 6 | 5.994012 | 0.03024 | 3.55 | 1.79 | 1.75 | 1.04 |
| 7 | 6.408738 | 0.03261 | 5.84 | 4.75 | 4.40 | 3.54 |
| 8 | 6.791115 | 0.03484 | 4.94 | 5.49 | 5.92 | 4.99 |
| 9 | 7.147287 | 0.036946 | 2.87 | 3.98 | 4.40 | 5.05 |
| 10 | 7.481695 | 0.03894 | 1.49 | 2.69 | 2.46 | 3.68 |
| 11 | 7.797662 | 0.04085 | 0.64 | 1.38 | 1.24 | 1.89 |
| 12 | 8.097756 | 0.04269 | 0.37 | 0.65 | 0.63 | 0.96 |
| 13 | 8.384003 | 0.0444 | 0.3 | 0.36 | 0.38 | 0.58 |
| >13 | Variable | Variable | 1.15[a] | 1.31[a] | 14.88[b] | 19.76[b] |
| | | **Total** | 22.64 | 23.53 | 37.06 | 42.32 |

[a] Maximum water concentration = 46.5; egg concentration = 14.6; probability of hatchability effects = 0.0876714813
[b] Maximum water concentration = 2658; egg concentration = 84.4; probability of hatchability effects = 0.8594

Results of the analysis indicate that conservation of 130 KAFY using on-farm methods would require the addition of up to 23 acres as indicated by predicted decreases in hatchability. Increasing the conservation level to 230 KAFY using only on-farm methods would increase the level of impact only slightly to 24 acres. A maximum of about 42 acres of drain vegetation would be necessary under a water conservation program using both on-farm and system-based conservation methods at the 300 KAFY level of conservation (Table 3.5-2).

### Other Water Quality Effects

Water conservation activities would reduce tailwater entering the drains. This reduction in tailwater would result in less sediment reaching the drains with an associated reduction in DDT and metabolite levels and other organochlorides attached to sediments. Likewise, reductions in organophosphate pesticides and phosphate and nitrogen fertilizers would be achieved. Exposure of covered species to these compounds therefore would be reduced.

## 3.5.2.2 Habitat and Direct Effects

The mechanisms through which the covered activities could take a covered species are changes in habitat (permanent or temporary changes), disturbance, or mortality/injury. The potential effects of each of the covered activities on drain vegetation and covered species using drain habitat are described in Table 3.5-3. Activities with the potential to affect habitat are described in more detail below. Activities that are not expected to affect habitat have a very limited potential to affect covered species, with potential effects limited to disturbance.

**TABLE 3.5-3**
Potential Effects of Covered Activities on Covered Species Associated With Drain Habitat

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| **Water Use and Conservation** | |
| Combined effects of on-farm and system-based water conservation | Water conservation will reduce the flow in the drains. However, the small reduction in the flow in the drains is not expected to result in changes in the amount of vegetation supported in the drains. |
| Installation of on-farm water conservation features | On-farm water conservation practices would be constructed within agricultural fields or their margins and therefore would not likely affect drain habitat or covered species using drain habitat. Constructed tailwater return ponds and delivery ponds could serve as added freshwater foraging areas to aquatic species in drains. |
| **Installation of System-Based Water Conservation Features** | |
| Canal lining and piping | Canal lining or piping results in modifications to canals with no physical changes to drains. Therefore, canal lining or piping would not likely affect drain habitat or covered species using drain habitat. |
| Construction of new canals | New canals would be constructed through agricultural fields and would tie into the existing canal system. Modifications, if any, to drains would occur where a crossing was necessary for the canal and one did not already exist. It is anticipated that construction of new canals would not likely affect drain habitat or covered species using drain habitat to any meaningful level. However, although drain crossings can remove vegetation when installed, they provide refugia for small fish and invertebrates that provide prey for foraging birds. |

**TABLE 3.5-3**
Potential Effects of Covered Activities on Covered Species Associated With Drain Habitat

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| Lateral interceptors | Lateral interceptors would be constructed in agricultural fields but would cross some drains. As described under Structure Maintenance below, IID anticipates constructing up to six drain crossings each year. Drain crossings for lateral interceptors are encompassed by those described under Structure Maintenance. |
| Reservoirs | IID could construct up to 100 reservoirs, 1 to 10 acres in size and encompassing up to 1,000 acres. These reservoirs would be on agricultural lands or barren lands and would not impact drain habitat.<br><br>Farmers are expected to construct 1- to 2-acre reservoirs to better regulate irrigation water. These reservoirs would be installed in agricultural fields and would not impact drain habitat. |
| Seepage recovery systems | Seepage recovery systems are proposed along the East Highline Canal. Potential effects to covered species using plant communities supported by seepage from the East Highline Canal are addressed under the Tamarisk Scrub Conservation Strategy. For covered species using drain habitat, potential effects of construction of seepage recovery systems are limited to construction of check structures for the surface recovery systems. Approximately 1.6 acres of drain vegetation could be permanently lost because of installation of surface seepage recovery systems. |
| **Operation and Maintenance** | |
| Conveyance system operation | Conveyance system operation is limited to moving water through the canals to meet maintenance and customer needs. Other than the filling, draining and moving water through the canals, no physical effects are encompassed by conveyance system operation. No effects to drain habitat or covered species using drain habitat would be expected. |
| **Drainage System Operation** | |
| Rerouting or constructing new drains | IID reroutes or constructs about 2 miles of drains every 10 years. Newly constructed drains would increase habitat for covered species associated with drain habitat. If IID constructed 2 miles of drains every 10 years, 15 miles of new drains would be created over the 75-year permit term, which could increase habitat for species associated with drain habitat. Rerouting drains would not change the amount of drain habitat.<br><br>Rerouting drains could result in the temporary reduction in vegetation in the drains during the period between abandonment of the old drain and when vegetation develops in the rerouted drain. No net loss of vegetation would occur because the rerouted portion would replace the abandoned section. |
| Piping drains | Over the 75-year term IID anticipates that about 50 miles of open drains would be pipelined, with an annual average of 0.67 mile of drain piping. About 22 acres of drain vegetation could be lost over the term of the permit from piping drains. |
| Inspection activities | Potential effects of inspection activities would be limited to a minor potential for disturbance of covered species if they occur in the vicinity of structures at the time of inspection. |

**TABLE 3.5-3**
Potential Effects of Covered Activities on Covered Species Associated With Drain Habitat

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| Canal lining maintenance | Canal lining maintenance consists of repairing the concrete lining of canals only with no physical changes to drains. Therefore, canal lining maintenance would not likely affect drain habitat or covered species using drain habitat. |
| Right-of-way maintenance<br>Embankment maintenance<br>Erosion maintenance | Along drains, right-of-way maintenance, including embankment and erosion maintenance, is conducted in association with vegetation control/sediment removal along drains. Potential impacts to covered species from these activities are encompassed by those under vegetation control. |
| Seepage maintenance | Seepage maintenance is conducted only along the canal system. Therefore, seepage maintenance would not likely affect drain habitat or covered species using drain habitat. |
| Structure maintenance | IID estimates that about 300 structures will be replaced each year. About 100 of these structures would be drainage structures. Along lateral drains, replacing each structure temporarily disturbs an area about 75 feet long. Thus, each year about 7,500 feet (1.4 miles) of the drains would be disturbed, temporarily removing 0.6 acres of vegetation. ([7500 ft X 14 ft / 43560]*26 percent vegetated)<br><br>Installation of new drain crossings could result in the permanent loss of drain vegetation. IID estimates that six 40-foot-wide crossings will be constructed each year. Based on this estimate, 18,000 feet (3.4 miles) of drain would be affected by drain crossings over the term of the permit, potentially resulting in the loss of 1.5 acres of drain vegetation. ([18,000 ft X 14 ft / 43560]*26 percent vegetated)<br><br>New structures that would be constructed on the drainage system would consist of control structures. Control structures are installed in steep drains that are eroding. Because of the erosion, drains needing control structures support little vegetation. Thus, construction of new control structures has a limited potential to affect drain habitat or associated covered species |
| Pipeline maintenance | Drain pipelines primarily occur in farm fields while conveyance system pipelines occur through developed areas. Neither of these areas support vegetation used by species associated with drain habitat. As such, the potential for pipeline maintenance to affect covered species is very low. |
| Reservoir maintenance | Reservoirs are located on the conveyance system. The reservoir embankments are relatively steep and vegetation is tightly controlled. These features make the reservoirs unattractive to covered species such that the potential for reservoir maintenance to affect covered species associated with drain habitat is very low. |
| Sediment removal | IID removes sediment from about 300 miles of drains annually. While IID strives to maintain vegetation on drain banks, vegetation within the channel is removed with sediment. Sediment removal temporarily reduces vegetation in the drains. An estimated 130 acres of vegetated drain is affected by sediment removal each year. |

**TABLE 3.5-3**
Potential Effects of Covered Activities on Covered Species Associated With Drain Habitat

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| Vegetation control | Vegetation control along canals focuses on removing moss and algae, and has little potential to affected covered species associated with drain habitat. Covered species associated with drain habitat are not expected to use canals because of the lack of vegetation, deep water, and high water velocity.<br><br>Along drains, mechanical and chemical methods are used to control vegetation. Mechanical and chemical control of vegetation is conducted in association with sediment removal described above. Thus, an estimated 130 acres of vegetation are temporarily affected each year. |
| New and Alamo River maintenance | IID dredges the deltas of the New and Alamo rivers about once every four years. In conducting this dredging, IID retains the vegetation on the banks. Thus, habitat is not affected by these dredging operations, but the dredging could temporarily disturb covered species using vegetation along the river channels. IID coordinates with USFWS at the refuge prior to conducting these activities. |
| Salton Sea dike maintenance | Salton Sea dike maintenance activities consist of replacing riprap, grooming embankments and repairing damaged sections of the dikes. Because the dikes do not support vegetation that covered species associated with drain habitat use, no change in habitat would occur with these activities. Potential effects are limited to a minor potential for disturbance. |
| Gravel and rock quarrying | Gravel and rock quarries do not occur in drains or immediately adjacent to marsh habitats. Thus, the potential for quarrying to affect covered species associated with drain habitat is minor. |
| Fish hatchery operation and maintenance | The fish hatchery is a developed facility and does not support habitat for covered species associated with drain habitat. |
| Recreational facilities | Because new recreational facilities would not be constructed in the drain prism, construction of recreational facilities would not be expected to affect habitat for species associated with drain habitat. If recreational facilities were constructed adjacent to drains, there would be a minor potential for disturbance of covered species during construction. The HCP does not cover take of covered species by recreationists. |

### Permanent Habitat Loss

Covered activities potentially resulting in the permanent loss of drain habitat are installation of seepage recovery systems, piping drains, and structure maintenance. The potential habitat effects of each of these activities is described below. In total, an estimated 25.1 acres of drain vegetation could be lost because of the covered activities over the term of the permit.

Seepage recovery systems are proposed along the East Highline Canal. Surface recovery systems are proposed where there is an existing drain that currently collects seepage from the East Highline Canal. Construction in the drain for these systems is minimal consisting of installation of a small check structure. Conservatively assuming 0.1 acre is impacted by each check structure, a maximum of 1.6 acres of drain vegetation could be permanently lost because of installation of surface seepage recovery systems.

Over the 75-year term, IID anticipates that about 50 miles of open drains (an annual average of 0.67 mile) would be pipelined. The entire drainage system encompasses an estimated 2,471 acres of which an estimated 26 percent (652 acres) is vegetated. Assuming that 26 percent of the 50 miles of drains piped is vegetated, 22 acres of drain vegetation could be lost over the term of the permit from piping drains.

Structure maintenance with the potential to eliminate drain vegetation consists of installation of new drain crossings. IID estimates that six, 40-foot-wide crossings will be constructed each year. Based on this estimate, 18,000 feet (3.4 miles) of drain would be affected by drain crossings over the term of the permit. Assuming the impacted area is 26 percent vegetated, about 1.5 acres of drain vegetation could be lost.

### Temporary Habitat Disturbance

Covered activities potentially resulting in the temporary loss of drain habitat are sediment removal/vegetation control and structure maintenance. The potential effects of these activities are described below. In total, an estimated 130 acres of drain vegetation could be temporarily disturbed by the covered activities each year.

The amount of vegetation in the drains was conservatively estimated at 652 acres; about 63 acres are cattail/bulrush and about 589 acres support other vegetation. IID anticipates that it will clear vegetation/sediment from approximately one-fifth (about 130 acres) of the vegetated acreage in the drains each year. Thus, on average, covered species in one-fifth of the habitat in the drains are exposed to drain cleaning each year. Drain cleaning could displace individuals, temporarily reduce habitat in the localized area of the cleaning, or destroy nests if covered species breed in the drains at the time of cleaning.

Structure replacement could temporarily remove drain vegetation. IID estimates that about 100 structures on drains will need to be replaced each year. Along lateral drains, replacing each structure temporarily disturbs an area about 75 feet long. Thus, each year about 7,500 feet (1.4 miles) of the drains would be disturbed, potentially resulting in the temporary removal of 0.6 acre of vegetation.

Drain cleaning and structure replacement does not permanently eliminate habitat. Rather, it results in a temporary reduction of vegetation in portions of the drains. Vegetation remains undisturbed in the remainder of the drainage system. In conducting drain cleaning activities, IID focuses sediment and vegetation removal on the center of the drain and strives to maintain vegetation on the drain banks. These aspects of IID's drain cleaning activities minimize impacts to covered species potentially resulting from fluctuations in the amount or type of vegetation. Furthermore, the existing habitat conditions in the drains are the product of IID's drain cleaning regime in which about one-fifth of the drainage system is cleaned each year. Thus, habitat would be expected to persist in the drains at a level and species composition similar to existing conditions.

Drain cleaning and other activities occurring near the drains is ongoing. Covered species use drain habitats in the HCP area and persist in the HCP area coincident with these activities. Yuma clapper rails have been reported in Holtville Main Drain annually since 1995 and in Trifolium No. 1 drain in all but one year since 1994 (USFWS unpublished data). In addition to Yuma clapper rails, the following covered species were reported in surveys of drains in the Imperial Valley: Cooper's hawk, loggerhead shrike, long-billed curlew,

northern harrier, peregrine falcon, sharp-shinned hawk, short-eared owl, tricolored blackbird, white-faced ibis, white-tailed kite, willow flycatcher, and yellow warbler (Hurlbert 1997). The observed use of the drains by American bitterns also suggests that least bitterns could use the drains. Because these species currently coexist with drain cleaning and other maintenance activities and habitat conditions in the drains are expected to remain similar to existing conditions, use of drain habitat by covered species is expected to remain similar to existing levels.

### 3.5.3 Approach and Biological Goals

The biological goal of the Drain Habitat Conservation Strategy is to maintain the species composition and life history functions (i.e., seasonal occurrence) of covered species using drain habitat within the HCP area. The specific objectives are to:

- Create managed marsh habitat that supports covered species associated with drain habitat
- Optimize management of the created marsh habitat to support covered species associated with drain habitat over the term of the permit

The Drain Habitat Conservation Strategy is composed of minimization and mitigation measures. Under the water conservation and transfer programs, the amount of water conservation will gradually increase. Thus, changes in water quality caused by the water conservation and transfer programs will occur gradually. This gradual increase in water conservation constitutes a minimization aspect of the HCP. Additional HCP measures that would minimize effects on covered species using drain habitats include:

- Avoiding dredging of the river deltas during the period when covered species could be breeding at the deltas (Drain Habitat–2)
- Survey for covered species prior to conducting scheduled construction activities and schedule construction activities to avoid the breeding season if covered species are found breeding in the area that would be affected (Drain Habitat–3)
- Seasonal restrictions on construction activities in areas inhabited by burrowing owls (Owl–4, –5, and –8)
- Seasonal restrictions on activities in pupfish drains (Pupfish–1)

These measures will reduce the potential for covered activities to result in take of covered species. In addition to these minimization aspects of the HCP, impacts to covered species potentially resulting from increased selenium concentration in the drains or from operation and maintenance activities associated with the drains will be mitigated by creating managed marsh habitat.

Creating additional habitat directly addresses actual effects of the covered activities that relate to changes in the amount or quality of habitat by providing alternative habitat. It also addresses disturbance and other risks to covered species using drain habitats by creating a safe haven where they are not exposed to the covered activities. By creating habitat that provides equal or greater habitat value than that currently supported in the HCP area, a similar or greater number of individuals of the covered species can be supported,

particularly because the amount of habitat in the drains is not expected to change substantially over the term of the permit. Thus, the impact of the take of any individuals using impacted habitats in the HCP area (e.g., drains) is minimized and mitigated by increasing the overall quality and quantity of available habitat in the HCP area and thereby creating conditions capable of supporting larger populations of the covered species than currently inhabit the HCP area.

### 3.5.4 Habitat Mitigation and Management Measures

The mitigation and management measures presented below are the specific actions that IID will undertake to fulfill the goals of the Drain Habitat Conservation Strategy. These measures serve as the basis for the contractual commitments described in the Implementation Agreement. The text following each measure provides additional clarification and describes the rationale for the measure. The key elements of the Drain Habitat Conservation Strategy are as follows:

- Create at least 190 acres of managed marsh habitat and up to a total of 652 acres of managed marsh habitat
- Reduce disturbance and mortality/injury of covered species from covered activities

***Drain Habitat–1.*** *IID will create at least 190 acres of managed marsh habitat. Within 1 year of the issuance of the incidental take permit, IID will conduct a vegetation survey of the drainage system following the protocol in Appendix B. Based on this vegetation survey, the HCP Implementation Team will determine the amount of habitat for covered species supported in the drains. The acreage required to compensate for selenium effects will be recalculated based on the results of the vegetation survey following the same methodology described in Section 3.5.2: Effects of the Covered Activities. If the acreage of habitat for covered species found in the drains through the vegetation survey plus the acreage required to compensate for selenium effects exceeds 190 acres, IID will create managed marsh habitat in an amount equal to the greater acreage up to a maximum of 652 acres. Creation of the managed marsh habitat will be phased over 15 years, with at least one-third of the total amount created within 5 years, two-thirds within 10 years, and the total amount created within 15 years of issuance of the incidental take permit.*

*IID will ensure that the water used to support the managed marsh habitat is irrigation water from the LCR or is other water with the same selenium concentration as water from the LCR or that meets an EPA selenium standard for protection of aquatic life that has received a No Jeopardy determination from the USFWS, whichever is greatest.*

*The managed marsh habitat will be created on lands owned by IID. IID will work with the HCP IT to determine the location and characteristics of the managed marsh habitat and develop long-term management plans. IID will submit habitat creation plans to the USFWS and CDFG for approval prior to initiation of habitat creation activities. Within 1 year of completing construction of managed marsh, IID will submit long-term management plans to the USFWS and CDFG for approval. IID will provide for the management of managed marsh habitat for the term of the permit.*

Under Drain Habitat–1, IID will create at least 190 acres of managed marsh habitat and up to 652 acres. The specific amount of managed marsh that IID will create will be determined through a vegetation survey completed within 1 year of issuance of the incidental take permit. Based on this survey, the HCP IT will determine the total amount of habitat for

covered species in the drains and the amount of managed marsh habitat necessary to offset selenium impacts. IID will create managed marsh habitat equal to the total amount of habitat in the drains plus additional habitat based on predicted toxicity effects from increases in selenium under the water conservation and transfer program.

The quality of the created managed marsh habitat is expected to be much higher than the habitat quality of the vegetation supported in the drains. Emergent freshwater marsh units on the state and federal refuges of the Imperial Valley currently support Yuma clapper rails. For at least the first third of created habitat, it is anticipated that the managed marsh will be created and managed in a similar same manner as the USFWS and CDFG manage emergent freshwater marsh units on the refuges. Based on the current management practices, the created managed marsh habitat is expected to consist of cattail/ bulrush vegetation. Cattail/bulrush vegetation provides higher quality habitat conditions for the covered species than the vegetation in the drains. Most of the vegetation in the drains is tamarisk or common reed; only a small amount of cattail/bulrush vegetation (about 63 acres) is estimated to be in the drains. Although current information indicates that covered species could use areas dominated by common reed and tamarisk, the level of use is low relative to cattail/bulrush areas. Further, habitat in the drains occurs as a narrow strip from about 3 to 15 feet wide and therefore, consists entirely of edge habitat. While cattail/bulrush in the drains is used by some covered species, the created marsh habitat is expected to support greater use (both in number of species and number of individuals) because the habitat will be in larger blocks with less edge habitat. Species diversity increases with the size of habitat patches (Harris and Silva-Lopez 1992; Brown and Dinsmore 1986) and reproductive success can be greater in larger patches than in narrow, linear habitats. Linear habitats have a high degree of edge habitat, and predation pressure is typically greater in edge-dominated habitats than more insular habitats (Harris and Silva-Lopez 1992).

The managed marsh habitat will be created on land owned by IID. The HCP IT will determine where to locate the created managed marsh habitat. In making this determination, the HCP IT will consider factors such as:

- Location relative to other wildlife habitat and populations of covered species (e.g., refuges)
- Potential conflicts with restoration projects for the Salton Sea
- Availability of facilities to deliver water to the managed marsh habitat
- Soils
- Land value

The HCP IT will ensure that the habitat is created in the best location to maximize the long-term benefits to covered species.

IID will support the created marsh habitat with better quality water than currently occurs in the drainage system. Under this measure, IID has committed to using irrigation water from the Colorado River or water of equivalent quality with respect to selenium or water that meets the EPA selenium standard with a No Jeopardy opinion. Irrigation water from the Colorado River is the best quality water available in the Imperial Valley. The selenium concentration in the LCR has averaged about 2.1 ppb in recent years (Table 2.2.1). For comparison, the average concentration of selenium in the New and Alamo rivers and selected drains emptying into these rivers has ranged from about 4 ppb to near 10 ppb (Table 2.2.1). Thus, in addition to the better habitat quality resulting from the plant species

composition and physical characteristics, the managed marsh habitat will have better water quality than the drains.

IID will manage the managed marsh or provide for its management by a third party for the term of the permit. The managed marsh will mitigate the impacts to species using drain habitat as a result of the water conservation and transfer project and O&M activities. At the end of the permit, IID will either continue the water conservation and transfer project or discontinue it. If the water conservation and transfer project is continued, then IID will have to extend incidental take authorization to cover the continued impacts associated with water conservation and transfer. It is reasonable that IID would continue to maintain the managed marsh. Alternatively, if IID discontinued the water conservation and transfer project, water quality conditions in the drains would return to pre-Project levels thus, obviating the need to continue to support the managed marsh to mitigate water quality effects.

With the termination of incidental take authorization for O&M activities at the end of the permit, IID would either have to avoid take of state and federal listed species or extend incidental take authorization. If IID elected to avoid take, there would be no need to continue to maintain the managed marsh to mitigate impacts of take associated with O&M activities. Alternatively, IID could extend its permit and continue to maintain the managed marsh habitat. Because take of covered species associated with drain habitat as a result of covered activities would cease at the end of the permit, it is not necessary or appropriate for IID to maintain managed marsh habitat in perpetuity. However, 5 years before the end of the permit (i.e., in year 70), IID will meet with the USFWS and CDFG to develop a strategy for minimizing impacts to covered species using the managed marsh habitat at the end of the permit term (See Section 5.6: End of Term of Incidental Take Authorization).

***Drain Habitat–2.*** *IID will not dredge the river deltas between February 15 and August 31, except as necessary to prevent flooding during storm events.*

IID dredges portions of the river deltas of the New and Alamo rivers about once every 4 years to maintain flow to the sea. In conducting this dredging, IID retains the vegetation on the banks of the river channels to maintain the stability of channels. Because vegetation is retained, habitat is not affected by these dredging operations and the principal concern for covered species that may be using the deltas is disturbance or injury. By not conducting these activities between February 15 and August 31, except in emergency situations, IID will avoid the breeding periods of covered species that could be using the river deltas for nesting. This commitment will minimize the potential for take of covered species breeding in the deltas.

***Drain Habitat–3.*** *For scheduled construction activities associated with the drainage system, before initiation of construction activities, IID will survey the construction site surveyed to determine whether any covered species are likely to breed at the site as evidenced by the occurrence of appropriate vegetation and/or surveys for covered species. If covered species are found to be potentially breeding on the project site, IID will schedule construction activities that would remove habitat to occur outside of the breeding season.*

In addition to potentially impacting suitable habitat, construction activities could disturb or injure covered species using the habitat. To minimize the potential for take of covered species from construction activities, IID will survey suitable habitat to determine if any

covered species are breeding in habitat that would be impacted by the construction activities. If the surveys indicate that covered species are likely to be breeding in habitat that would be affected, IID will schedule activities that would affect the habitat to occur outside of the breeding season. Outside of the breeding season, IID could remove habitat. By scheduling construction activities that would remove habitat to occur outside of the breeding season, IID will minimize the potential to injure or disturb covered species.

### 3.5.5 Effects on Habitat

The approach to the Drain Habitat Conservation Strategy is to create managed marsh habitat of greater value than habitats actually affected by the covered activities. Under the Drain Habitat Conservation Strategy, an amount of managed marsh habitat equal to the total amount of habitat in the drains plus an additional amount of habitat based on predicted toxicity effects from increases in selenium under the water conservation and transfer program would be created. At least 190 acres of high-quality marsh habitat and up to 652 acres would be created within 15 years of issuance of the ITP. This habitat would be created in large blocks, and would be expected to consist of cattails, bulrush, sedges, and other emergent wetland plants, depending on the USFWS management of habitat for Yuma clapper rails on the Salton Sea NWR.

The Drain Habitat Conservation Strategy would more than double the acreage of habitat for drain-associated species. Consisting of cattails and bulrush, the created habitat also would provide substantially greater habitat value than the existing vegetation in the drains. The larger blocks of created habitat also would increase its attractiveness and value to wildlife as compared to the narrow, linear habitat of the drains.

The drains would continue to support vegetation similar in character and quantity to existing vegetation. IID has been conducting O&M activities along the drainage system for many decades and would continue these O&M activities over the term of the permit. The vegetation currently supported in the drains is a product of these maintenance activities. Although the water conservation activities could reduce the quantity and quality of water in the drains, this potential reduction is not expected to result in a substantial change in the extent and characteristics of vegetation in the drains (see Section 4.7 of the EIS/EIR). Thus, the drains would continue to support habitat and species composition at a level similar to that which currently exists in the drains, and covered species could continue to use this habitat.

IID would use water with selenium concentration low enough to avoid adverse reproductive effects to support the managed marsh habitat. The selenium concentration of water used to support the managed marsh is expected to be close to 2 ppb. This selenium concentration is considerably lower than the selenium concentration in most of the drains in the HCP area. Adverse effects from selenium toxicity would be avoided in the managed marsh and the quality of the managed marsh habitat would be further enhanced beyond that in the drains.

### 3.5.6 Effects on Covered Species

Covered species associated with marsh habitats known to use or potentially using habitats in the HCP area include resident breeding species, migratory breeding species, winter visitors, and transient species that may use marsh habitat during migration or other

wanderings. Many of the covered species associated with marsh habitat are not likely to use vegetation within the confines of a drain to a great degree (e.g., short-eared owls, greater sandhill cranes), but would likely use the larger, more open configuration of the created marsh habitat. As such, these species would be largely unaffected by the covered activities, but would benefit from creation of high-quality marsh habitat. Even though individuals of some of the covered species could be taken as a result of the covered activities, the Drain Habitat Conservation Strategy is expected to maintain or increase the level of use of the HCP area by covered species because conditions in the drains are not expected to change substantially while the Drain Habitat Conservation Strategy will approximately double the amount of habitat. The effects of the Drain Habitat Conservation Strategy on covered species are evaluated below.

As part of the Monitoring and Adaptive Management Program (Chapter 4), IID could implement a survey or study program requiring capture of covered species. Capture of covered species constitutes take under both the federal and state ESAs. Take that occurs in association with surveys or studies conducted for this HCP is a covered activity and will be authorized under the state and federal ITPs. Any of the covered species could be taken through surveys or studies.

Studies and surveys conducted during the course of this HCP will be developed by IID in coordination with the HCP IT and will be subject to the approval of CDFG and USFWS prior to implementation. In approving the studies/surveys, the CDFG and USFWS will require capture methods that minimize the potential for death and injury of covered species. In addition, these agencies will specify the number of individuals of covered species that may be captured. Thus, the level of take authorized to occur through this mechanism will be specified on a case-by-case basis through the approval of the CDFG and USFWS.

#### 3.5.6.1 Yuma Clapper Rail

In the HCP area, Yuma clapper rails predominantly occur on the state and federal refuges. Since 1990, the number of clapper rails counted on the Imperial WA has varied between 90 and 331, and on the Salton Sea NWR, clapper rail numbers have fluctuated between 13 and 102. Combined, the refuges in the HCP area have supported 106 to 411 clapper rails each year. Although comprehensive surveys have not been completed in areas off of the refuges, habitat availability is limited off of the refuges. Consistent with the limited habitat availability off of the refuges, the number of clapper rails reported off of the refuges has been low, ranging from 3 to 43 in surveys conducted between 1990 and 1999. Few of these sightings were in the drains and clapper rails have only been reported in three drains (Holtville Main, Trifolium No. 1, Bruchard).

Agricultural drains support limited use by clapper rails. High quality habitat for Yuma clapper rails consists of mature stands of dense or moderately dense cattails intersected by water channels. Rails breed, forage and find cover in this type of habitat. Rails have also been reported using areas of common reed although nesting is uncertain and the density is lower than in cattail marshes. The IID drainage system is estimated to contain about 63 acres of cattails. Common reed, tamarisk, and arrowweed are the predominant species of the remaining 589 acres of vegetation estimated in the drainage system. The vegetation characteristics of the drains suggest that the drains provide poor quality habitat for rails. Further, Anderson and Ohmart (1985) found the home ranges of rails to average about

18.5 acres/pair. The drains are unlikely to support a block of vegetation of this size, which further suggests that habitat in the drains is of limited quality to rails. A maximum of nine rails have been reported in two drains. Breeding has not been verified in the drains but rails have been documented to be present in surveys of drains during the breeding season.

Potential effects of the covered activities on clapper rails consist of disturbance, temporary and permanent loss of habitat, destruction of nests, and exposure to increased selenium concentrations. IID cleans about one-fifth of the drainage system each year. Thus, about 12.6 acres of cattails could be subject to drain cleaning each year. Rails inhabiting these areas could be displaced as a result of drain cleaning and if they breed in the drains, there is some potential for a nest to be lost because of the drain cleaning. To the extent that rails use common reed, a few individuals could be displaced by drain cleaning activities. Considering the poor quality of common reed habitat and availability of this vegetation in areas unaffected by covered activities (e.g., along the New or Alamo Rivers), displaced individuals would likely quickly find alternate habitat.

Drain maintenance activities and several other covered activities also have the potential to result in take of clapper rail through temporary or permanent reductions in the amount of habitat. As described in Section 3.5.2.2, various maintenance and water conservation activities have the potential to temporarily and permanently impact drain vegetation. Drain maintenance results in the temporary loss of an estimated 12.6 acres of cattail vegetation, some of which could be used by clapper rail. In total, an estimated 25.1 acres of drain vegetation of which only a few acres (estimated 2.5 acres) could be cattails would be permanently impacted. These temporary and permanent reductions in cattails in the drains could result in a minor reduction in potential habitat for Yuma clapper rail.

Rails could be exposed to slightly higher concentrations of selenium in the drains. Based on the evaluation of the effects of increased selenium concentrations, using the stilt standard, the reproductive success of rails foraging in the drains could be reduced slightly relative to existing conditions. Assuming that all of the vegetation in the drains provides potential foraging habitat for Yuma clapper rails, up to 42 acres of managed marsh habitat could be needed to offset the maximum projected decline in reproductive rate resulting from selenium concentrations in the drains at the maximum level of water conservation and transfer (see Section 3.5.2.1).

Under the HCP, IID will create at least 190 acres and up to 652 acres of managed marsh habitat. Based on the vegetation survey, IID will create at least an equivalent amount of habitat as is supported in the entire drainage system. The created habitat will be of substantially better quality for Yuma clapper rails than the habitat in the drains because it will contain preferred plant species (i.e., cattails and bulrush), have better water quality than the drains, and be configured to provide a mix of dense vegetation interspersed with open water. The created habitat is anticipated to be managed in a similar manner as emergent freshwater marsh units are managed on the refuges. The units on the refuges support the majority of the clapper rail population in the Imperial Valley. With an equivalent or greater acreage as supported in the drains, but with much higher quality, the created marsh habitat is expected to support a larger population of Yuma clapper rails than currently is supported in the drains.

Clapper rails establish territories as early as February with nesting and incubation beginning in mid-March. IID will avoid potential impacts to birds that could be using the river deltas during the breeding season by not dredging the deltas of the New or Alamo rivers after mid-February. In addition, prior to conducting scheduled construction activities in the drains, IID would survey the construction area. If covered species are found to be breeding in the construction area, IID would schedule the construction activity to occur after the breeding season. These measures will avoid and minimize the potential for destruction of nests and disturbance that could interfere with breeding behavior.

Estimates of rail densities vary widely, ranging from 0.06 to 1.26 rails/acre (Table 3.5-4). Based on these estimates, the number of rails supported by 190 acres of created marsh could range from 11 to 239 rails if all the habitat were designed for Yuma clapper rails. Probably, a smaller number of clapper rails would be supported because a portion of the marsh would be managed for other covered species (e.g., black rails). Habitat for Yuma clapper rails would continue to be available in the drains and clapper rails would be expected to persist in the drains at existing levels. Therefore, the created marsh would act to increase the amount of habitat and overall population of clapper rails in the HCP area and thereby benefit the species. With implementation of the minimization and avoidance measures, and creation of high quality managed marsh habitat, the Drain Habitat Conservation Strategy would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of Yuma clapper rail.

**TABLE 3.5-4**
Reported Densities of Yuma Clapper Rails

| Location | Density Rails/Acre[a] | Source |
|---|---|---|
| LCR | 0.10 | Anderson and Ohmart (1985) |
| Cienega de Santa Clara | 0.36 | Piest and Campoy (1998) |
| Cienega de Santa Clara | 0.60[b] | Piest and Campoy (1998) |
| Topock Marsh | 0.06 | Smith (1975, reported in Piest and Campoy [1998]) |
| Mittry Lake Wildlife Area | 0.39 | Todd (1980, reported in Piest and Campoy [1998]) |
| Hall Island | 1.26 | Todd (1980, reported in Piest and Campoy [1998]) |

[a] Acres of cattail habitat
[b] Estimated density taking into account nonresponding birds

### 3.5.6.2 California Black Rail

California black rails occur in the HCP area in small numbers. In a 1989 survey for the species at the Salton Sea and surrounding areas, 13 birds were recorded at the mouth of the New River, eight were in seepage communities along the Coachella Canal, and one was found at Finney Lake. Up to 50 black rails have been reported in the wetland complex supported by seepage from the AAC between Drops 3 and 4. Black rails have not been reported to occur in the drains. Black rails are most closely associated with bulrush vegetation although they will use areas dominated by cattails. Their apparent low occurrence in the HCP area may reflect this preference for bulrush, which is not as common in the HCP area as are cattails.

California black rails could be directly or indirectly taken as a result of several covered activities. Drain maintenance activities could flush rails from drain vegetation which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation they are subject to predation. In the event that black rails breed in drain vegetation in the HCP area or start breeding in the HCP area over the 75-year permit term, drain maintenance activities could result in the direct destruction of nests.

On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. However, only a very small amount of this vegetation might be suitable for California black rails. The IID drainage system is estimated to contain about 63 acres of cattails, a species that can be used by black rails but is not preferred. If 20 percent of the estimated 63 acres of cattails are subject to drain maintenance each year, black rails could be exposed to drain maintenance activities in about 12.6 acres. Because of the limited occurrence and distribution of black rails in the HCP area, particularly in the drains, the potential for take of black rails by drain maintenance activities and the number of rails potentially affected is low.

Drain maintenance activities and several other covered activities also have the potential to result in take of black rail through temporary or permanent reductions in the amount of habitat. As described in Section 3.5.2.2, various maintenance and water conservation activities have the potential to temporarily and permanently impact drain vegetation. Drain maintenance results in the temporary loss of an estimated 12.6 acres of cattail vegetation, some of which could be used by black rail. In total, an estimated 25.1 acres of drain vegetation, of which only a few acres (estimated 2.5 acres) could be cattails, would be permanently impacted. These temporary and permanent reductions in cattails in the drains could result in a minor reduction in potential habitat for California black rail. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the low level of use of cattails by black rail, and the low level of use of drains in the HCP area by black rail, overall population-level effects would not be expected.

California black rails that forage in the drains could be exposed to increased selenium levels. Assuming that all of the vegetation in the drains provides potential foraging habitat for black rails, as was assumed for Yuma clapper rails, up to 42 acres of managed marsh habitat could be needed to offset the maximum projected decline in reproductive rate resulting from selenium concentrations in the drains at the maximum level of water conservation and transfer (see Section 3.5.2.1).

Implementation of the Drain Habitat Conservation Strategy would be expected to increase the amount and quality of habitat for black rail in the HCP area. Under the Drain Habitat Conservation Strategy, IID will create at least 190 acres of managed marsh habitat and up to 652 acres. The HCP IT will consider the specific habitat needs of black rails in developing site-specific creation and management plans for the managed marsh. The managed marsh habitat will be of better quality for black rails than the habitat affected in the drains because it would:

- Consist of one or more large blocks
- Contain preferred vegetation (bulrush)
- Have better water quality

Flores and Eddleman (1991) have suggested that California black rails are capable of rapidly colonizing new habitat. Thus, black rails could take advantage of the newly created habitat within a short period of time. Given the current low level of use of the HCP area by black rails, the high-quality habitat created under the HCP, and the rail's ability to rapidly colonize new habitats, the HCP could contribute to increasing the population and distribution of California black rails.

The few records of black rails in the HCP area include areas adjacent to the Salton Sea and the New River deltas among others. Like clapper rails, black rails breed in the early spring. Black rails have been reported using the New River delta. IID will avoid potential impacts to birds that could be nesting in this area by not dredging the deltas of the New or Alamo rivers after mid-February. In addition, prior to conducting scheduled construction activities in the drains, IID would survey the construction area. If covered species are found to be breeding in the construction area, IID would schedule the construction activity to occur after the breeding season. These measures will avoid and minimize the potential for destruction of nests and disturbance that could interfere with breeding behavior.

Few estimates are available on the naturally occurring density of California black rails in marsh habitats. Repking and Ohmart (1977) estimated the density of black rails in spring along the LCR as 0.4 to 0.6 rail/acre. At this density, the 190 acres of marsh habitat created under the HCP could support up to 114 black rails. However, because the needs of all of the covered species associated with drain habitat will be considered in designing the managed marsh, the level of use by black rails probably would not reach this maximum level. Nonetheless, with implementation of the minimization and avoidance measures, and creation of high quality managed marsh habitat, the Drain Habitat Conservation Strategy would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of California black rail.

#### 3.5.6.3 Bald Eagle

A few bald eagles (three or fewer) are regularly observed at the Salton Sea during winter. The principal potential effect of the covered activities on bald eagles is a potential decline in the availability of fish in the Salton Sea. As described in more detail in Section 3.3.5.13, a few bald eagles could be taken as a result of reduced foraging opportunities at the Salton Sea over the term of the permit. Bald eagles are not known to use the drains and because of the abundance of fish and waterfowl at the Salton Sea and adjacent refuges, the drains do not provide essential foraging habitat for bald eagles. Thus, no adverse effects to bald eagles would be expected from covered activities operating in the drainage system.

Bald eagles could benefit from the Drain Habitat Conservation Strategy. Although fish are the primary prey of bald eagles, they also prey on waterfowl. Under the Drain Habitat Conservation Strategy, at least 190 acres and up to 652 acres of marsh habitat would be created. The Imperial Valley and Salton Sea areas are heavily used by wintering and migrating waterfowl. While not target species of the HCP, the created marsh habitat would attract migrating and wintering waterfowl. As such, it would provide additional foraging opportunities for bald eagles, overall benefiting the species. If foraging opportunities became limited because of reductions in fish availability at the Salton Sea, the managed marsh habitat would provide alternate foraging habitat and thereby, mitigate potential impacts. Therefore, implementation of the HCP would not jeopardize the continued existence of bald eagles.

### 3.5.6.4 Bank Swallow

Bank swallows are casual visitors to the HCP area, potentially occurring in the HCP area as migrants during the spring and fall. For foraging, they are not strongly associated with any particular habitat type, although they often forage near water where insects are abundant. The covered activities are unlikely to adversely affect bank swallows because of the swallow's rare occurrence in the HCP area and broad habitat use for foraging. However, a few individuals could be taken because of changes in foraging habitat availability or quality potentially resulting from permanent or temporary reductions in drain vegetation (see Section 3.5.2.2), permanent or temporary reductions in tamarisk scrub habitat (see Section 3.4.2), or changes in the composition and amount of agricultural field habitat (see Section 3.8.2).

The Drain Habitat Conservation Strategy would contribute mitigating the impact of any take of bank swallows that could result from the covered activities. Under the Drain Habitat Conservation Strategy, at least 190 acres and up to 652 acres of marsh habitat would be created. The created marsh habitat would benefit bank swallows by increasing foraging opportunities. Loss of tamarisk scrub habitat at the Salton Sea and in the Imperial Valley would be offset through the creation/acquisition and long-term protection of native tree habitat (see Sections 3.3.4.2 and 3.4.5). By supporting more abundant and diverse insect populations than tamarisk scrub, native tree habitat would provide higher quality foraging opportunities for bank swallows. Critical to the perpetuation of agriculture field habitat in the Imperial Valley where bank swallows could forage is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for bank swallows. In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.5.6.5 White-Faced Ibis

White-faced ibis typically nest in extensive marshes, constructing nests in tall marsh plants such as cattails and bulrushes over water. In the HCP area, white-faced ibis use tamarisk and mesquite snags in the Salton Sea for nesting in addition to marshes on the state and federal refuges and other areas adjacent to the Salton Sea. They roost at these locations as well as on private duck clubs. Habitat quality and quantity on the state and federal refuges and private duck clubs would not be affected under the HCP. It is unlikely that any ibis nest or roost in vegetation in the drains because of the species' association with extensive marshes or other isolated and protected locations for nesting. Thus, temporary or permanent loss of vegetation in the drains from the covered activities would not likely affect white-faced ibis.

White-faced ibis are known to forage in the drains (Hurlbert et al. 1997) and some individuals could be exposed to increased selenium levels. Based on the assumption that white-faced ibis forage throughout the entire drainage system, the acreage of managed marsh required to offset the maximum potential reproductive impairment attributable to exposure to selenium in the drains was calculated following the procedure in Section 3.5.2.1. This analysis showed that 160 acres of managed marsh habitat would be necessary to offset potential selenium effects under the circumstance that white-faced ibis foraged exclusively in the drains and used the entire drainage system. However, white-faced ibis appear to

predominantly forage in agricultural fields. Thus, with prey from the drains comprising only a portion of the diet, the potential for ibis to experience reduced reproductive output because of increased selenium concentrations in the drains is limited.

Some nesting sites could be lost if a reduction in the elevation of the Salton Sea, exposes snags currently used by white-faced ibis. However, tamarisk stands over water would continue to be available along the New and Alamo River deltas although the deltas are disturbed every few years for channel dredging. These river maintenance activities could result in disturbance or removal of active nests and thereby result in take of a white-faced ibis. To avoid this potential for take, under the Drain Habitat Conservation Strategy dredging would not occur between February 15 and August 31, except as necessary to prevent flooding during storm events.

Under the HCP, IID would create at least 190 acres and up to 652 acres of marsh habitat. This acreage would more than compensate for the maximum acreage necessary to offset selenium effects (i.e., 160 acres). White-faced ibis would be expected to benefit from the creation of marsh habitat under the HCP. The new habitat would be created in large blocks, creating extensive, undisturbed marsh habitat preferred by white-faced ibis. Riparian trees and shrubs could be integrated with the created marsh habitat as mitigation for tamarisk scrub habitat. These features, as well as the cattail and bulrush vegetation supported in the marsh, would provide preferred nesting and roosting habitats for white-faced ibis. Considering the poor quality of habitat in the drains, and expected persistence of currently used habitat in the HCP area, the habitat created under the HCP would increase the overall amount and quality of habitat in the HCP area for this species. Implementation of the Drain Habitat Conservation Strategy would not jeopardize the continued existence of white-faced ibis.

#### 3.5.6.6 Least Bittern

Least bitterns typically are associated with extensive cattail and bulrush marshes. In the HCP area, least bitterns nest in marsh habitats adjacent to the Salton Sea, principally on the state and federal refuges. The extent to which least bitterns use vegetation in the drains is uncertain. Least bitterns probably forage in the drains, but are not likely to nest in drain vegetation. Least bitterns typically nest in large marsh areas and the drains provide only scattered patches of emergent vegetation.

Least bitterns could be directly or indirectly taken as a result of several covered activities. Drain maintenance activities could flush bitterns from drain vegetation which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation they are subject to predation. In the event that bitterns breed in drain vegetation in the HCP area or start breeding in the HCP area over the 75-year permit term, drain maintenance activities could result in the direct destruction of nests.

On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. However, only a small amount of this vegetation likely would be suitable for least bitterns. The IID drainage system is estimated to contain about 63 acres of cattails with which bittern are typically associated. If 20 percent of the estimated 63 acres of cattails are subject to drain maintenance each year, least bittern could be exposed to drain maintenance activities in about 12.6 acres. Because of

the limited occurrence and distribution of least bitterns in the HCP area, particularly in the drains, the potential for take of least bitterns by drain maintenance activities and the number of bitterns potentially affected is low.

Drain maintenance activities and several other covered activities also have the potential to result in take of least bitterns through temporary or permanent reductions in the amount of habitat. As described in Section 3.5.2.2, various maintenance and water conservation activities have the potential to temporarily and permanently impact drain vegetation. Drain maintenance results in the temporary loss of an estimated 12.6 acres of cattail vegetation, some of which could be used by least bitterns. In total, an estimated 25.1 acres of drain vegetation, of which only a few acres (estimated 2.5 acres) could be cattails, would be permanently impacted. These temporary and permanent reductions in cattails in the drains could result in a minor reduction in potential habitat for least bittern. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the low level of use of cattails by least bitterns, and the low level of use of drains in the HCP area by least bitterns, no adverse population-level effects would be expected.

Least bitterns probably forage in the drains to some degree, and individuals could be exposed to increased selenium levels. Assuming that all of the vegetation in the drains provides potential foraging habitat for least bitterns, as was assumed for Yuma clapper rails, up to 42 acres of managed marsh habitat could be needed to offset the maximum projected decline in reproductive rate resulting from selenium concentrations in the drains at the maximum level of water conservation and transfer (see Section 3.5.2.1).

Implementation of the Drain Habitat Conservation Strategy would be expected to increase the amount and quality of habitat for least bittern in the HCP area. Under the HCP, IID would create at least 190 acres and up to 652 acres of marsh habitat. The HCP IT will consider the specific habitat needs of least bitterns in developing site-specific creation and management plans for the managed marsh. The new habitat could be created in large blocks, creating the extensive, undisturbed marsh habitat preferred by least bitterns. Riparian trees and shrubs probably would be integrated with the managed marsh habitat as mitigation for tamarisk scrub habitat. These features as well as the cattail and bulrush vegetation supported in the marsh would provide preferred nesting and roosting habitats for least bitterns. Considering the poor quality of habitat in the drains, and expected persistence of currently used habitat in the HCP area, the habitat created under the HCP would increase the overall amount and quality of habitat in the HCP area for this species. Given the current low level of use of the HCP area by least bittern, the high-quality habitat created under the HCP could contribute to increasing the population and distribution of this species.

The created marsh habitat would be concentrated in one or more large blocks of marsh vegetation interspersed with open water areas. This habitat would be expected to be used by least bitterns to a greater degree and would likely support nesting by these birds. Rosenberg et al. (1991) estimated the breeding density of least bitterns in marshes of the LCR as 0.4 bird/acre. At this density, the 190 acres of created marsh habitat could support 76 least bitterns while 652 acres could support 260 bitterns. The least bittern population at the Salton Sea has been estimated at 550 birds. Thus, the managed marsh habitat created under the HCP could increase the population by 14 percent and possibly up to 47 percent if 652 acres of habitat is created. However, because the needs of all of the covered species associated with

drain habitat will be considered in designing the managed marsh, the level of use by least bitterns probably would not reach this maximum level. Nonetheless, with implementation of the minimization and avoidance measures, and creation of high quality managed marsh habitat, the Drain Habitat Conservation Strategy would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of California least bittern.

### 3.5.6.7 Fulvous Whistling-Duck

The Salton Sea area has supported up to about 200 whistling-ducks during the spring and summer, with a much smaller breeding population. In recent decades, the fulvous whistling-duck has declined in the southwestern United States, while increasing in numbers in the Southeast. Primary factors contributing to the decline of fulvous whistling-ducks in California are draining and development of marsh habitats and hunting.

Fulvous whistling-ducks nest in areas of dense cattails near the south end of the Salton Sea and forage on wetland plants and submerged aquatic vegetation in freshwater habitats that occur on the state and federal refuges and private duck clubs. Drains could provide some foraging and nesting habitat for fulvous whistling-ducks, although the quality of nesting habitat probably is limited

Fulvous whistling-ducks could be directly or indirectly taken as a result of several covered activities. Drain maintenance activities could flush ducks from drain vegetation which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation they are subject to predation. In the event that fulvous whistling-ducks breed in drain vegetation in the HCP area or start breeding in the HCP area over the 75-year permit term, drain maintenance activities could result in the direct destruction of nests.

On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. However, only a small amount of this vegetation might be suitable for fulvous whistling-ducks. The IID drainage system is estimated to contain about 63 acres of cattails, preferred nesting habitat for fulvous whistling-ducks. If 20 percent of the estimated 63 acres of cattails are subject to drain maintenance each year, the ducks could be exposed to drain maintenance activities in about 12.6 acres. Because of the limited occurrence and distribution of fulvous whistling-ducks in the HCP area, particularly in the drains, the potential for take by drain maintenance activities and the number of ducks potentially affected are low.

Drain maintenance activities and several other covered activities also have the potential to result in take of fulvous whistling-ducks through temporary or permanent reductions in the amount of habitat. As described in Section 3.5.2.2, various maintenance and water conservation activities have the potential to temporarily and permanently impact drain vegetation. Drain maintenance results in the temporary loss of an estimated 12.6 acres of cattail vegetation, some of which could be used by fulvous whistling-ducks. In total, an estimated 25.1 acres of drain vegetation of which only a few acres (estimated 2.5 acres) could be cattails would be permanently impacted. These temporary and permanent reductions in cattails in the drains could result in a minor reduction in potential habitat for fulvous whistling-ducks. Over the term of the permit, a few individuals could be adversely

affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the low level of use of the drains by fulvous whistling-ducks and continued availability of habitat on the state and federal refuges where this species currently predominantly occurs, no adverse population-level effects would be expected.

Implementation of the Drain Habitat Conservation Strategy would be expected to increase the amount and quality of habitat for fulvous whistling-duck in the HCP area. Under the Drain Habitat Conservation Strategy, IID will create at least 190 acres of managed marsh habitat and up to 652 acres. The HCP IT will consider the specific habitat needs of fulvous whistling-duck in developing site-specific creation and management plans for the managed marsh. The managed marsh habitat will be of better quality for fulvous whistling-ducks than the habitat affected in the drains because it would:

- Consist of one or more large blocks
- Contain preferred vegetation
- Have better water quality

Given the current low level of use of the HCP area by fulvous whistling-ducks, the high-quality habitat created under the HCP could contribute to increasing the population and distribution of this species.

In addition to creating managed marsh habitat to compensate for potential habitat effects, prior to conducting scheduled construction activities in the drains, IID will survey the construction area. If covered species (including fulvous whistling-ducks) are found to be breeding in the construction area, IID will schedule the construction activity to occur after the breeding season. These measures will avoid and minimize the potential for destruction of nests and disturbance that could interfere with breeding behavior. With implementation of the minimization and avoidance measures, and creation of high-quality managed marsh habitat, the Drain Habitat Conservation Strategy would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of fulvous whistling-ducks.

#### 3.5.6.8 Golden Eagles

Golden eagles occur at the Salton Sea only as accidentals during the winter and spring. Much of the HCP area could be used by golden eagles for foraging; however, golden eagles are most likely to concentrate foraging activities in areas of high prey concentrations. In the HCP area, the Salton Sea and managed marsh at the state and federal wildlife refuges, as well as private duck clubs, attract abundant waterfowl populations during winter. Agricultural fields also attract waterfowl and golden eagles may forage in desert habitat as well. With the abundance of waterfowl at the Salton Sea and adjacent refuges, the potential for and level of take of golden eagles as a result of changes in drain habitat would be minimal. However, over the term of the permit, a few golden eagles could be taken as a result of changes in foraging opportunities associated with agricultural fields. Take of golden eagles could result from reductions in agricultural fields; this potential effect is evaluated in Section 3.8.6.18.

Implementation of the Drain Habitat Conservation Strategy would benefit this species and offset impacts that could result from changes in agricultural field habitat. Under the Drain Habitat Conservation Strategy, at least 190 acres and up to 652 acres of marsh habitat would

be created. The Imperial Valley and Salton Sea areas are heavily used by wintering and migrating waterfowl. While waterfowl are not target species of the HCP, the created marsh habitat would attract migrating and wintering waterfowl and provide additional foraging opportunities for golden eagles. Therefore, implementation of the HCP would not jeopardize the continued existence of golden eagles.

### 3.5.6.9 Short-Eared Owl

Short-eared owls are rare winter visitors to the Salton Sea area, but are more common in the fall. The USFWS (1997) characterizes them as occasional visitors with normally fewer than five individuals at the Salton Sea National Wildlife Refuge (NWR). Short-eared owls forage for small mammals in open habitats such as agricultural fields and marshes.

As described in more detail in Section 3.8.6.5, over the term of the permit, a few individual short-eared owls could be taken as a result of reduced foraging opportunities in agricultural fields of the Imperial Valley. Short-eared owls are not known to use the drains and the drains do not provide essential foraging habitat. Thus, no adverse effects to short-eared owls would be expected from covered activities occurring in the drainage system.

Short-eared owls could benefit from the Drain Habitat Conservation Strategy. Under the Drain Habitat Conservation Strategy, at least 190 acres and up to 652 acres of marsh habitat would be created. This managed marsh habitat would provide additional foraging opportunities for short-eared owls, overall benefiting the species. If foraging opportunities were reduced to any extent because of changes in agricultural fields, the managed marsh habitat would provide alternate foraging habitat and thereby, mitigate potential impacts. Implementation of the HCP would not jeopardize the continued existence of short-eared owls.

### 3.5.6.10 Northern Harrier

Northern harriers are common fall and winter residents in the HCP area, but occur only occasionally during the spring and summer. They are not currently known to breed in the HCP area but could in the future. Northern harriers forage for small mammals typically in agricultural fields and marshes. They have been reported in surveys of agricultural drains in the Imperial Valley (Hurlbert et al. 1997).

Northern harriers could be directly or indirectly taken as a result of several covered activities associated with the drainage system. Drain maintenance activities could flush harriers from drain vegetation which could constitute take as harassment. Death or injury as a result of being flushed is unlikely. If northern harriers breed in drain vegetation in the HCP area over the 75-year permit term, drain maintenance activities could result in the direct destruction of nests. On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. However, only a small amount of this vegetation might be suitable for harriers such that the potential for take and level of take from drain maintenance activities is low.

Drain maintenance activities and several other covered activities also have the potential to result in take of northern harrier through temporary or permanent reductions in the amount of habitat. As described in Section 3.5.2.2, various maintenance and water conservation activities have the potential to temporarily and permanently impact drain vegetation. Drain

maintenance results in the temporary disturbance of an estimated 130 acres of vegetation each year, some of which could be used by northern harriers. In total, an estimated 25.1 acres of drain vegetation could be permanently impacted. These temporary and permanent reductions in vegetation in the drains could reduce foraging and nesting opportunities for northern harriers. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this habitat reduction.

Implementation of the Drain Habitat Conservation Strategy is expected to increase the amount and quality of habitat for northern harrier in the HCP area. Under the Drain Habitat Conservation Strategy, IID will create at least 190 acres of managed marsh habitat and up to 652 acres. The managed marsh habitat will be of better quality for northern harrier than the habitat affected in the drains. The high-quality habitat created under the HCP could contribute to increasing the population and distribution of this species.

In addition to creating managed marsh habitat to compensate for potential habitat effects, prior to conducting scheduled construction activities in the drains, IID will survey the construction area. If covered species (including northern harriers) are found to be breeding in the construction area, IID would schedule the construction activity to occur after the breeding season. These measures will avoid and minimize the potential for destruction of nests and disturbance that could interfere with breeding behavior. With implementation of the minimization and avoidance measures, and creation of high quality managed marsh habitat, the Drain Habitat Conservation Strategy would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of northern harriers.

#### 3.5.6.11 Tricolored Blackbird

Tricolored blackbirds are rare in the HCP area. They occur during spring and winter (USFWS 1997b; Garrett and Dunn 1981). They are not known to breed in the HCP area although they could in the future. Tricolored blackbirds are associated with marsh habitat, principally cattail vegetation. One individual was reported during surveys of drains in the Imperial Valley (Hurlbert et al. 1997).

Tricolored blackbirds could be directly or indirectly taken as a result of several covered activities. Drain maintenance activities could flush birds from drain vegetation which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation they are subject to predation. In the event that tricolored blackbirds breed in drain vegetation in the HCP area over the 75-year permit term, drain maintenance activities could result in the direct destruction of nests.

On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. However, only a small amount of this vegetation might be suitable for tricolored blackbird. The IID drainage system is estimated to contain about 63 acres of cattails, preferred nesting habitat for tricolored blackbirds. If 20 percent of the estimated 63 acres of cattails are subject to drain maintenance each year, the blackbirds could be exposed to drain maintenance activities in about 12.6 acres. Because of the rare occurrence of tricolored blackbirds in the HCP area, particularly in the drains, the potential for take by drain maintenance activities and the number of birds potentially affected is low.

Drain maintenance activities and several other covered activities also have the potential to result in take of tricolored blackbirds through temporary or permanent reductions in the amount of habitat. As described in Section 3.5.2.2, various maintenance and water conservation activities have the potential to temporarily and permanently impact drain vegetation. Drain maintenance results in the temporary loss of an estimated 12.6 acres of cattail vegetation, some of which could be used by tricolored blackbirds. In total, an estimated 25.1 acres of drain vegetation, of which only a few acres (estimated 2.5 acres) could be cattails, would be permanently impacted. These temporary and permanent reductions in cattails in the drains could result in a minor reduction in potential habitat for tricolored blackbirds. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the low level of use of the HCP area by tricolored blackbirds, no adverse population-level effects would be expected.

Implementation of the Drain Habitat Conservation Strategy would be expected to increase the amount and quality of habitat for tricolored blackbirds in the HCP area. Under the Drain Habitat Conservation Strategy, IID will create at least 190 acres of managed marsh habitat and up to 652 acres. The managed marsh habitat will be of better quality for tricolored blackbirds than the habitat affected in the drains because it would provide large blocks that could support a nesting colony and would consist of preferred vegetation (i.e., cattails and tules). The high-quality habitat created under the HCP could encourage establishment of a nesting colony of tricolored blackbirds.

In addition to creating managed marsh habitat to compensate for potential habitat effects, prior to conducting scheduled construction activities in the drains, IID will survey the construction area. If covered species (including tricolored birds) are found to be breeding in the construction area, IID would schedule the construction activity to occur after the breeding season. These measures will avoid and minimize the potential for destruction of nests and disturbance that could interfere with breeding behavior. With implementation of the minimization and avoidance measures, and creation of high quality managed marsh habitat, the Drain Habitat Conservation Strategy would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of tricolored blackbirds.

# 3.6 Desert Habitat Conservation Strategy

## 3.6.1 Amount and Quality of Habitat in the HCP Area

Desert habitat in the HCP area occurs in the rights-of-way of the AAC, East Highline and portions of the Westside Main, Thistle, and Trifolium Extension canals (see Figure 2.3-9). Table 3.6-1 shows the miles of each canal adjacent to desert habitat. IID's right-of-way along the AAC varies from about 750 to 2,000 feet wide. IID's rights-of-way on the East Highline, Westside Main, Thistle, and Trifolium Extension canals are highly variable ranging from about 80 feet to 300 feet. The canal, canal embankments, and maintenance roads take up much of the rights-of-way of these canals, such that the amount of desert habitat actually within IID's rights-of-way is limited.

**TABLE 3.6-1**
Miles of Canals Adjacent to Desert Habitat

| Canal | Miles |
|---|---|
| All American | 60 |
| Westside Main | 6 |
| East Highline | 40 |
| Thistle | 5 |
| Trifolium Extension | 10 |
| **Total** | **121** |

The desert habitat consists predominantly of creosote bush scrub; dune habitat occurs along the AAC where it traverses the Algodones Dunes. Some of the covered species (e.g., Algodones Dunes sunflower) could only occur in the HCP area where the AAC passes through the dunes, but most of the covered species are associated with creosote bush habitat. Habitat quality varies along the AAC and the other canals. However, O&M activities have been ongoing within the rights-of-way since the canals were constructed. As a result, much of the area within IID's right-of-way is disturbed. In addition, offroad vehicle use is common in the vicinity of the AAC and has contributed to habitat degradation.

## 3.6.2 Effects of the Covered Activities

Many of the covered activities have no potential to take or adversely affect covered species associated with desert habitat. These covered activities and an explanation of why species associated with desert habitat would not be impacted are listed in Table 3.6-2. The remaining covered activities have a limited potential to take a covered species as discussed below.

Covered activities with some potential to affect covered species associated with desert habitat are:

- Conveyance system operation
- Inspection activities
- Canal maintenance
- Right-of-way maintenance
- Sediment removal
- Structure maintenance
- Vegetation control
- Hydroelectric power plant maintenance

The potential for these activities to impact covered species associated with desert habitat is low and generally is limited to direct injury or mortality from being struck by motor vehicles and disturbance of covered species inhabiting desert habitat adjacent to the rights-of-way. Potential effects of these activities on covered species associated with desert habitat are described below. Burrowing owls also can inhabit desert areas and be impacted by these activities but they are addressed individually as described in Section 3.7.1.

**TABLE 3.6-2**
Covered Activities That Would Not Affect Covered Species Associated With Desert Habitat

| Activity | Reason for No Effect |
|---|---|
| On-farm water use and conservation | On-farm water use and conservation activities would be only conducted on lands used for agricultural production. No on-farm conservation measures would be implemented on desert habitat. |
| System-based water conservation | System-based water conservation measures include canal lining, installation of lateral interceptors, installation of reservoirs, and seepage recovery systems. No canal lining is proposed as part of the water conservation and transfer programs for the AAC, East Highline, Westside Main, Thistle, or Trifolium extension canals. Canal sections proposed for lining are in agricultural areas of the Imperial Valley removed from desert habitat (Figure 1.7-3). Proposed locations for lateral interceptors are within agricultural areas, removed from areas supporting desert habitat (Figure 1.7-4). Reservoirs would be constructed in agricultural areas, removed from areas supporting desert habitat. Seepage recovery systems are proposed along the East Highline Canal. However, all construction required to install these systems would be conducted on the west side of the canal, and desert habitat is limited to the east side of the canal. |
| Drainage system operation | Drainage system operation is limited to moving water through the drains. No physical effects are encompassed by drainage system operation. |
| Seepage maintenance | Any actions to correct seepage problems that would occur along the AAC (excluding canal lining), East Highline, Westside Main, Thistle, or Trifolium Extension canals would be conducted on the agricultural side of the canal and therefore, would not affect covered species associated with desert habitat. |
| Pipeline maintenance | Because no pipelines occur on the desert side of canals, pipeline maintenance would not affect covered species associated with desert habitat. |
| Maintenance of New and Alamo rivers | The AAC, East Highline, Westside Main, Thistle, and Trifolium Extension canals and their rights-of-way do not intersect the New or Alamo rivers in areas supporting desert habitat. |
| Salton Sea dike maintenance | The AAC, East Highline, Westside Main, Thistle, and Trifolium Extension canals and their rights-of-way do not intersect the dikes at the Salton Sea. |
| Gravel and rock quarrying | No gravel or rock quarries occur in the rights-of-way of the AAC, East Highline, Westside Main, Thistle, or Trifolium Extension canals. |
| Fish hatchery operation and maintenance | The fish hatchery is not located in the rights-of-way of the AAC, East Highline, Westside Main, Thistle, or Trifolium Extension canals. |
| Recreational facilities | Although IID permits fishing in the AAC, East Highline, and Westside Main canals, IID has not developed nor anticipates developing recreational facilities along any of these facilities. The HCP does not address take of covered species by recreationists. |

Conveyance system operation consists of moving water through the canals to meet customer and maintenance needs. These activities consists of filling, draining and moving water through the canals and therefore does not entail activities that could impact desert habitat. Potential effects to covered species from conveyance system operation are limited to the potential for

individuals to be struck by vehicles as workers travel along the conveyance system. To ensure proper water deliveries, workers travel portions of the canal system on a daily and repetitive basis. Along all of the canals, vehicular travel is on the established road adjacent to the canal, and along the East Highline, Westside Main, Thistle, and Trifolium Extension, most travel is on the agricultural side of the canals. As a result, the potential for a covered species to be struck by a vehicle while conducting conveyance system operations is low.

Inspection activities consist of workers visiting structures to ensure they are working properly and make minor repairs or adjustments. Potential effects of this activity on covered species is limited to individuals being struck by a vehicle as the worker travels to structures. Inspections activities are conducted about once a month. As explained for conveyance system operations, vehicle travel occurs on established roads. Further, along the East Highline, Westside Main, Thistle, and Trifolium Extension canals, most travel is on the agricultural side of the canals where the delivery and drainage structures are located. Thus, the potential for a covered species to be struck by a vehicle while conducting inspection activities is low.

Canal maintenance consists of maintaining the seepage recovery systems adjacent to the AAC, managing the abandoned section of the AAC as an emergency channel, and maintaining the canal lining of the future AAC parallel canal. IID operates three seepage recovery systems along the AAC (one at Drop 3 and two at Drop 4). These systems are open seepage recovery systems. About once every 5 years, IID removes vegetation from these systems. Because vegetation consists of plant species typical of drain habitat and not desert plants, desert habitat would not be affected. Potential impacts consist of a minor potential for disturbance if covered species occur in adjacent areas. Because excavators move very slowly when removing vegetation (stop-and-go cycle), active individuals of the covered species likely would be able to avoid being struck by the excavator. However, some of the covered species (e.g., flat-tailed horned lizards, Colorado Desert fringe-toed lizards) could be vulnerable during inactive periods or because they become motionless when threatened (e.g., flat-tailed horned lizards). While tracking to the job site, excavators move at a very low speed (<5 mph).

After completion of the AAC Lining Project, IID anticipates managing abandoned canal section as an emergency channel. Management is expected to consist of mechanical and chemical vegetation control. These actions would be conducted at least annually. Vegetation control of the abandoned section would not result in a loss of habitat because desert habitat does not currently exist as the canal is still in use. Vegetation control and sediment removal would maintain the canal free of vegetation discouraging colonization by covered species. Even if some covered species ventured into the abandoned section, the potential for take of a covered species is minor because sediment removal and vegetation control activities would be conducted infrequently (about once a year) and the equipment used to conduct these activities is very slow moving.

The future parallel canal along the AAC will be a concrete-lined channel whereas the existing canal is earthen. Future canal maintenance activities will include repairing and replacing concrete lining. These activities are conducted in and immediately adjacent to the canal and are entirely within disturbed areas of IID's right-of-way. No effects to habitat would occur and potential effects to covered species would be limited to a minor potential for disturbance if covered species occurred in areas adjacent to the construction work.

Right-of-way maintenance along canals adjacent to desert habitat is focused on the roads along the canals and the canal embankments. Roadways are regularly graded and watered. One grader and water truck is assigned full time to the AAC. Grading is continual along the portion of the AAC within the Imperial Valley with all of the valley portion of the AAC covered in three months. With the exception of the portion of the AAC that traverses the Algodones Dunes, for the portions of the AAC outside of the Imperial Valley, the roadway is graded about once a year. Occasionally, IID must recreate a portion of the road because of blowing sand. Roadways of the East Highline, Westside Main, Thistle, and Trifolium are graded and watered several times a year.

Along the portion of the AAC that traverses the Algodones Dunes, IID annually knocks down portions of the sand dunes, creating a flatter slope that allows sand to blow across the canal. In conducting this flattening, a dozer drags an I-beam back and forth across the peaks of the dunes to level them. The area where this activity is conducted begins at the Coachella Turnout (Sta. 1907+20) and extends to about Sidewinder Road at Pilot Knob (Sta. 1243+65), a distance of 12.56 miles. The area actually disturbed is about 50 to 75 feet wide yielding a total acreage disturbed of 76 to 114 acres. This operation begins in July every year and lasts about 6 weeks. In conjunction with flattening the dunes, the roadways along the AAC are cleared of accumulated sand. After the roads are opened up, they are immediately treated with herbicides for vegetation control. IID has been conducting these activities since the construction of the AAC in about 1945.

Grading and watering roads does not remove any habitat for covered species such that potential effects to covered species are limited to being struck by moving vehicles. However, because the equipment (graders, water trucks, dozers) used to conduct right-of-way maintenance is slow moving, the potential for a covered species to be struck is low. Along the East Highline, Westside Main, Thistle, and Trifolium, the likelihood of this impact is less because the roads along these canals are on the agricultural field side. Reconstructing and clearing the road, and flattening the dunes along the Algodones Dunes portion of the AAC could result in the removal of a covered plant species, if any covered plants colonized the area.

Right-of-way maintenance also includes embankment maintenance. At times material from the canal embankment washes down the embankment. A dozer is used to reshape the outside of the canal embankments. The East Highline, Westside Main, Thistle, and Trifolium Extension canals do not have embankments such that the activity is limited to the AAC. Along the AAC, the need for embankment maintenance is very spotty and irregular. About once every 10 years, an area requires reshaping.

Reservoir maintenance is generally the same as canal maintenance. Vegetation is controlled around the reservoir, embankments are graded, groomed and stabilized about every 5 years. Occasionally, concrete lining is repaired or replaced. No reservoirs currently exist on the AAC. Two reservoirs on the East Highline Canal and one on the Westside Main Canal occur adjacent to desert habitat (see Figure 2.3-5). Maintenance activities are focused on the reservoir embankments and do not enter adjacent areas where desert habitat and associated species could occur.

Structure maintenance on canals consists of servicing, repairing and replacing structures required to deliver water to customers as well as controlling vegetation around the structures to maintain access. Table 3.6-3 summarizes the type and number of structures on the AAC, East Highline, Westside Main, Thistle, and Trifolium Extensions. Because only a portion of the

Westside Main, Thistle, and Trifolium Extension canals are adjacent to desert habitat, only a portion of the structures listed in Table 3.6-3 occur in areas where the canal is adjacent to desert.

**TABLE 3.6-3**
Structures on the AAC, East Highline, Westside Main, Thistle, and Trifolium Extension canals.

| | Canals[a] | | | | |
|---|---|---|---|---|---|
| **Structure** | **AAC** | **EHL** | **WSM** | **Thistle** | **TriExt** |
| Bridges | 0 | 15 | 12 | 0 | 1 |
| Check | 7 | 25 | 49 | 60 | 29 |
| Control structure | 0 | 2 | 4 | 0 | 0 |
| Crossing (road, rail, drain, delivery) | 11 | 2 | 49 | 39 | 31 |
| Drop structure | 5 | 0 | 0 | 0 | 0 |
| Flume | 0 | 1 | 2 | 0 | 0 |
| Gate | 28 | 68 | 148 | 101 | 57 |
| Heading | 28 | 76 | 55 | 0 | 0 |
| Hydropower facility | 5 | 0 | 0 | 0 | 0 |
| Overpass | 1 | 0 | 0 | 0 | 0 |
| Pump | 4 | 14 | 4 | 2 | 2 |
| Reservoir inlet | 0 | 1 | 1 | 0 | 0 |
| Siphon | 1 | 0 | 5 | 0 | 6 |
| Spill gate | 3 | 0 | 4 | 5 | 6 |
| **Total** | **93** | **204** | **333** | **207** | **132** |

[a] AAC = All American Canal; EHL = East Highline Canal; WSM = Westside Main Canal; TriExt = Trifolium Extension

Routine activities associated with structure maintenance consist of making minor repairs and adjustments and maintaining the area around the structure free of vegetation. Vegetation is tightly controlled around structures such that habitat never develops for covered species. The routine maintenance activities are conducted in proximity to the structures and within the area maintained clear of vegetation such that covered species are very unlikely to occur in the area. Traveling to the structure to conduct maintenance activities has a minor potential to take a covered species, as explained for conveyance system operations and inspection activities.

Over the 75-year permit term, IID anticipates replacing all of the structures along the canals at least once. For major structures such as hydropower generation facilities, an area up to 20 acres in size can be disturbed by the construction. However, the area disturbed in replacing a facility would be the same as when the facility was originally installed and all construction would be within IID's right-of-way. Thus, removal of previously undisturbed desert vegetation is not anticipated. Replacement of large facilities could disturb covered species if they inhabit areas adjacent to the construction area or covered species could be injured if they entered the construction area.

Vegetation control along these canals consists of chaining within the prism of the canal. In chaining, a tractor traveling along the road adjacent to the canal drags a chain on the inside of the canal prism. Because the tractor remains on an established road and all work is conducted within the canal prism, there are no effects to desert vegetation. Potential effects to covered species associated with desert habitat are limited to being struck by the vehicle. However, the potential for this effect is low because the tractor moves very slowly such that individuals would be able to avoid the vehicle. The outer embankments of the AAC are maintained free of vegetation through regular grading as described under right-of-way maintenance. No vegetation control is conducted on the desert side of the East Highline, Westside Main, Thistle, or Trifolium Extension canals.

Hydroelectric power plant maintenance consists of controlling vegetation around the hydroelectric facility. Potential effects of this activity are the same as described for structure maintenance.

### 3.6.3 Approach and Biological Goals

In the HCP area, desert habitat only occurs in the right-of-way of the AAC, adjacent to the East Highline Canal and adjacent to sections of the Westside Main Canal, Thistle, and Trifolium Extension. The primary covered activities with the potential to affect species associated with desert habitat are the O&M activities associated with the canals and to a more limited degree the hydroelectric facilities on the AAC. As briefly summarized above, covered activities have the potential to affect covered species by directly killing or injuring an individual (primarily resulting from motor vehicles) or from disturbance. IID also could conduct construction activities to replace or rehabilitate facilities or install new facilities. Construction could kill, injure, or disturb individuals of covered species, or indirectly affect covered species through changes in habitat quality or quantity.

The approach to the Desert Habitat Conservation Strategy is to implement a program to minimize the potential for take of covered species during O&M activities. If construction activities are required within the rights-of-way during the term of the permit, additional measures would be implemented to minimize the potential for take and to compensate for any decrease in habitat quality or availability. The biological goal of the Desert Habitat Conservation Strategy is to avoid and minimize death or physical injury of individuals of the covered species, and to improve habitat contiguity and persistence to compensate for changes in habitat quality or quantity caused by construction activities.

### 3.6.4 Desert Habitat Mitigation and Management Measures

The mitigation and management measures described below are the specific actions that IID will undertake to fulfill the goals of the Desert Habitat Conservation Strategy. The key elements of the conservation strategy are as follows:

- Implement a worker education program
- Implement interim measures to avoid and minimize the potential for take of covered species during O&M and construction activities
- Refine avoidance and minimization measures based on species surveys and adaptive management program

- Conduct surveys to determine the occurrence of covered species in the right-of-way
- Protect habitat outside of the right-of-way when construction activities reduce the quality or availability of habitat

***Desert Habitat–1.*** *IID will implement a worker education program. Workers conducting O&M activities along the AAC, East Highline, Westside Main, Thistle, or Trifolium Extension canals will be required to attend a worker education program to ensure proper implementation of the HCP measures addressing desert habitat. Workers will be instructed on the requirements of the HCP within six months of issuance of the incidental take permit. The worker education program will be conducted at least annually to ensure instruction of new employees and as a refresher. For new workers, IID will ensure that they are informed of and understand the requirements of the HCP prior to conducting O&M activities either individually or through the annual education program.*

*The worker education program will instruct workers on the identification and habitat association of covered species using desert habitat. Pictures of the different habitat types will be included in the manual with a list of covered species potentially occurring in each habitat type. Activities with the potential to affect covered species inhabiting desert habitat and the practices to follow to minimize potential adverse effects to these species will be explained (see Desert Habitat–2). Workers will be instructed on procedures approved by the HCP IT for moving covered species in the event that a covered species is found during O&M activities and is in imminent danger from covered activities. Workers will be required to report any observations of dead or injured individuals of the covered species or when they relocate an individual (see Desert Habitat–2 and –3).*

*A worker education manual will be prepared by IID with the concurrence of USFWS and CDFG within 1 year of issuance of the incidental take permit. The manual will be distributed to each person conducting O&M activities along the AAC, East Highline, Westside Main, Thistle, or Trifolium canals. The manual will include a photograph/drawing of each covered species associated with desert habitat and brief information on its identification. As information of the occurrence and distribution of covered species along the AAC, East Highline, Westside Main, Thistle, and Trifolium Extension canals becomes available through the survey program (see Desert Habitat–4), it will be added to the manual. The manual will also summarize the HCP's requirements for O&M activities for easy reference. The HCP IT will review the manual annually for 3 consecutive years and every 5 years thereafter, and update it as appropriate.*

The primary concern for covered species using desert habitat relates to O&M activities. The effectiveness of avoidance and minimization measures (Desert Habitat–2) will depend on workers being familiar with the covered species and understanding the requirements of the HCP with respect to these species. A worker education program is critical to ensuring that measures are implemented properly.

***Desert Habitat–2.*** *IID will conduct O&M activities in accordance with the following measures.*

- *Workers will be instructed to be alert to the occurrence of covered species in roadways while driving and to avoid hitting individuals at all times.*
- *Prior to moving a parked vehicle, workers will check around and underneath the vehicle for covered species. If a covered species is found in harm's way and is moving, it will be allowed to move away from the vehicle on its own accord before the vehicle is moved. If the individual is not moving, the worker will relocate the individual to a nearby safe location following procedures outlined in the worker education program.*

- *Workers will be familiarized with covered plants species and instructed to avoid injuring or uprooting plants.*
- *Workers will properly dispose of garbage in closed containers to minimize raven attraction.*
- *Workers will not be permitted to bring pets to the work site.*
- *IID will restrict O&M activities to previously disturbed areas within the right-of-way along the existing AAC, the future parallel canal, East Highline and portions of the Westside Main, Thistle, and Trifolium Extension canals where the canals are adjacent to native desert habitat.*
- *O&M will include periodic removal of vegetation from the maintenance roads and canal embankments to prevent establishment of vegetation that could attract covered species.*

*These practices are interim measures and may be modified over the term of the permit based on survey results and through the adaptive management and monitoring program (see Desert Habitat–4 and Chapter 4). The HCP IT will review these measures annually for 3 consecutive years (years 2, 3, and 4 after permit issuance) and at least every 5 years thereafter, and may adjust the measures as long as the adjustments do not increase the total cost of implementing the HCP.*

For covered species of reptiles, a primary concern for O&M activities is the potential for motor vehicle traffic to strike individuals as they are crossing the road or basking on the road surface. Reptiles also will seek out the shade created by parked vehicles. Because of these behaviors, reptiles are vulnerable to being killed or injured from motor vehicles. Covered mammalian and amphibian species also are at risk of being struck by motor vehicles. Through the first two measures, the potential for covered species to be impacted by motor vehicles will be reduced.

For construction activities in areas inhabited by desert species such as desert tortoise, the USFWS typically requires that motor vehicles travel at 20 mph or less within the construction area and on roads accessing the construction site. Its effectiveness has not been demonstrated but this measure is believed to allow drivers to spot and avoid animals that are crossing or basking on the road. In conducting O&M activities, it is not practicable for IID to restrict vehicles to 20 mph or less along canals adjacent to desert habitat. The AAC is about 80 miles long and is adjacent to desert habitat for 60 miles. The East Highline Canal is about 40 miles long. Workers need to be able to travel the length of these canals to operate, inspect, maintain and repair structures along these canals as quickly as possible. Given the length of the canal AAC and East Highline, traveling the length of either canal and returning would take a full day if a 20 mph speed limit was enforced. This limit would significantly impair IID's ability to maintain and operate its conveyance system and therefore is not practicable to include in the avoidance and minimization measures for O&M. In addition, along portions of the AAC, road conditions prevent traveling at high speeds, and in some locations road conditions are such that traveling at 20 mph or less is prudent. Also, there is currently a 40 mph speed limit imposed for safety along the AAC.

Garbage that is not properly disposed of can attract avian and mammalian predators (e.g., ravens and coyotes) and increase the local abundance of predators. These predators could prey on covered species and could become a substantial mortality agent for some species. For example, predation by ravens on eggs and young is a considerable concern for desert tortoise populations. By properly disposing of garbage, IID will avoid attracting predators and increasing predator populations that could result in detrimental levels of predation on covered species along and adjacent to the AAC, East Highline, and Westside Main canals.

Previously disturbed areas in the rights-of-way along the AAC, East Highline, Westside Main Canal, Thistle, and Trifolium Extension canals provide poor habitat quality for the covered species. Plants are not likely to become established in areas continuously disturbed. Covered plants would not be expected to occur in these routinely disturbed areas and covered animals would not be expected to occur because habitat would not develop. By restricting activities to disturbed areas, IID will further reduce the potential to directly injure a covered species. In addition, impacts to desert habitat would be avoided and no changes in habitat availability or quality for the covered species would occur.

***Desert Habitat – 3.*** *IID will implement the following measures while conducting scheduled construction activities within its rights-of-way along the AAC, East Highline, and portions of the Westside Main, Thistle, and Trifolium Extension canals containing native desert habitat. Scheduled construction activities are structure maintenance activities (see Table 3.6-3) and canal lining, excluding the Proposed AAC Canal Lining Project (Reclamation and IID 1994).*

- *Where practicable, IID will limit construction activities, including vehicle travel, in the rights-of-way of the AAC and future parallel canal, the East Highline Canal, and the Westside Main Canal to previously disturbed areas.*
- *Staging areas will be situated on the agricultural side of the canal except where the canal is not bordered by agricultural areas.*
- *Prior to initiating construction activities, the HCP Implementation Biologist will conduct a habitat survey of the construction area and adjacent areas. Based on the habitat conditions and species survey information, the biologist will determine which covered species are likely to occur in or immediately adjacent to the construction area. IID will implement the species-specific minimization and avoidance measures contained in Appendix C for the species identified by the biologist.*
- *A biological monitor will be onsite during construction activities or exclusion fencing will be erected to keep covered species out of the construction area following clearance surveys, if conducted (see Appendices C and H).*
- *If a covered animal species occurs on the project site during construction, construction activities adjacent to the individual's location will be halted and the individual allowed to move away from the construction area on its own accord. If the individual is not moving, the biological monitor or other trained worker will relocate it to a nearby safe location outside of the construction area.*
- *The construction area will be clearly flagged prior to the start of construction activities and all construction activities will be confined to the demarcated area. To the extent practicable, the construction area will be situated and demarcated to avoid habitat for covered species.*
- *After completion of the construction activities, IID will restore any native vegetation temporarily impacted by the construction. If native desert vegetation would be temporarily impacted by construction, prior to the start of construction activities, IID will develop a vegetation restoration and management plan in conference with the HCP IT. The vegetation restoration and management plan will describe: (1) the amount and species composition of the vegetation that would be impacted, (2) the actions that IID will take to restore the disturbed area, (3) the criteria for assessing the success of the restoration, (4) the actions that will be undertaken if the success criteria are not achieved, and (5) long-term management actions. For native desert vegetation permanently lost, IID will mitigate in accordance with Desert Habitat–5.*

- *A speed limit of 20 miles/hour will be maintained on the construction site, staging areas, and storage areas.*
- *No pets will be permitted on the construction site.*
- *Prior to moving a parked vehicle, the ground around and under the vehicle will be inspected for covered species. If an individual of a covered species is found and is moving, it will be allowed to move away from the vehicle on its own accord. If it is not moving, it may be removed and relocated to a nearby safe location following the procedures outlined in the worker education program.*

*For a particular construction project, IID may implement alternative measures or modify the standard or species-specific avoidance and minimization practices if agreed to by the USFWS and CDFG. In addition, the standard and species-specific avoidance and minimization practices may be modified over the term of the permit based on survey results and through the adaptive management and monitoring program (see Desert Habitat–4, Desert Habitat–5, and Chapter 4). The HCP IT will review these measures annually for three consecutive years (years 2, 3, and 4 following permit issuance) and at least every five years thereafter, and may adjust the measures as long as the adjustments do not increase the cost of implementation.*

IID may undertake various construction activities along the AAC, East Highline Canal, and portions of the Westside Main, Thistle, and Trifolium Extension canals adjacent to native desert habitat during the term of permit. The specific location of this construction is not currently known and the specific effects on species associated with desert habitat cannot be determined. With this measure, IID commits to determine the effects of a construction project on habitat for covered species and to take actions to avoid and/or mitigate potential effects to covered species as a result of construction activities.

Covered species could be injured or disturbed by construction activities. The actions that IID will implement under Desert Habitat–3 are typical practices required by CDFG and USFWS to avoid and minimize impacts to listed species during construction projects. The measures are designed to minimize the potential for death or injury of covered species during construction and to compensate for any reduction in the quality or quantity of habitat for covered species.

***Desert Habitat–4.*** *Within one year of the issuance of the incidental take permit, IID will initiate a baseline survey of its rights-of-way on the AAC, the East Highline Canal, and the portions of the Westside Main, Thistle, and Trifolium Extension canals adjacent to desert habitat to determine the occurrence and location of covered species. The baseline surveys will be conducted for three consecutive years. The worker education manual (see Desert Habitat–1) will be revised to include a habitat map and map(s) of known locations of each of the covered species within the rights-of-way of these canals. The surveys will be repeated at least every five years and the worker education manual updated as necessary to accurately portray the occurrence and distribution of covered species within IID's right-of-way. The interval for repeating the surveys and updating the manual may be lengthened if agreed to by IID, USFWS, and CDFG. The HCP IT will develop the specific survey protocols.*

Most of the covered activities that will occur in the rights-of-way of the AAC, East Highline, Westside Main, Thistle, and Trifolium Extension canals are O&M activities. These O&M activities are focused on maintaining access roads to the canal and associated facilities clear of

vegetation and accessible by equipment, and maintaining the structural integrity and capacity of canals. O&M activities generally do not involve disturbance of native desert habitat and are concentrated in previously disturbed areas. Because most of the covered activities occurring in the right-of-way would not affect habitat quality or quantity, the primary concern for covered species is the potential for covered species to be injured by equipment operation.

By knowing where covered species occur along the canals adjacent to native desert habitat, IID can better educate its workforce to avoid and minimize the potential to injure a covered animal species during O&M activities. Further, IID will be able to design and schedule construction activities to avoid and minimize impacts to covered animal species.

The greatest threat to covered plant species is the potential for the plants to be injured or uprooted by equipment. By surveying the rights-of-way and educating the workforce on procedures to follow in areas supporting covered plants, the potential for covered plants to be impacted will be minimized or avoided. Information on the location of covered plant species will also be used to design and carry out construction activities in a manner that avoids or minimizes direct impacts to covered plant species. By repeating the surveys over the term of the permit and educating workers to recognize covered plant species, plants that colonize new locations will be similarly protected.

The baseline surveys described in Chapter 4 will fulfill the obligation to survey for covered species within three years. The same survey protocol and methods will be followed in conducting the subsequent recurring surveys.

***Desert Habitat–5.*** *If desert habitat used by covered species would be permanently lost as a result of O&M or construction activities, IID will determine the amount of habitat lost and acquire, or grant a conservation easement on land at a 1:1 ratio for the acreage impacted within 1 year of the removal of the habitat. IID will not permanently remove more than 100 acres of native desert habitat and/or tamarisk scrub habitat over the term of the permit. Tamarisk scrub habitat would be mitigated in accordance with Tree Habitat–1.*

- *Land to be acquired or subject to the conservation easement will have (1) known use by covered species that use the impacted areas or (2) be situated adjacent to areas of occupied habitat and support suitable habitat for the covered species that use the impacted habitat, and (3) is deemed to have long term viability as habitat for covered species based on its patch size, connectivity or location to other conserved habitat. IID will work with the HCP IT to identify a property to acquire or cover with a conservation easement. IID will place a conservation easement on this acquired land or otherwise provide for the protection of the property in perpetuity. With the approval of USFWS and CDFG, which approval shall not be unreasonably withheld, IID may transfer the land to a third party who agrees to and is authorized to manage the land for habitat conservation purposes. If IID transfers the land to a third party, IID will establish an endowment fund adequate to provide for the management of the land in perpetuity.*
- *Within 1 year of recording a conservation easement, IID will prepare and submit to the USFWS and CDFG for approval a management plan for acquired land and lands it owns that are subject to a conservation easement that describes how the property will be managed to maintain its suitability for the covered species. The management plan will describe the actions that IID will take to maintain the ecological functions of the acquired habitat. While the specific management needs will vary depending on the property acquired, considerations for the management plan include:*

- *Measures to control human access (e.g., fencing, signage)*
- *Frequency at which land will be visited to assess maintenance/management needs*
- *Types of maintenance action (e.g., removing garbage, repairing fences)*
- *Vegetation management practices (e.g., prescribed burning, removal of exotic plants)*

*IID will provide for the management of the property in perpetuity.*

If habitat used by covered species will be permanently lost, IID will acquire and preserve other desert habitat and ensure that it is managed for desert habitat values in perpetuity. This measure is derived from the Biological Opinion for the AAC Lining Project in which desert habitat is to be acquired and transferred to Bureau of Land Management if habitat for the flat-tailed horned lizard is affected (USFWS 1996). The Biological Opinion specified a 1:1 ratio because desert habitat quality along the AAC is low. Only minor amounts of desert habitat, if any, occurs in the rights-of-way of the East Highline and Westside Main canals and what habitat does occur is disturbed, providing only low quality habitat. IID would employ a similar measure to mitigate impacts to covered species associated with desert habitat potentially resulting from construction projects in the rights-of-way of the AAC, East Highline Canal or portions of the Westside Main Canal adjacent to desert habitat.

## 3.6.5 Effects on Habitat

Desert habitat only occurs in the HCP area adjacent to the AAC, along the eastern edge of the East Highline Canal and along the western edge of portions of the Westside Main, Thistle, and Trifolium Extension canals. The covered activities that would occur in the rights-of-way of these canals primarily consist of O&M activities. Under the Desert Habitat Conservation Strategy, IID would limit these activities to previously disturbed areas. Thus, the amount and quality of desert habitat in the HCP area would not be expected to change. The Desert Habitat Conservation Strategy also includes provisions to preserve desert habitat off site in the event that covered activities do result in the loss or degradation of desert habitat. Offsite compensation areas would be identified in coordination with the USFWS and CDFG, ensuring that any acquired areas would benefit the covered species.

## 3.6.6 Effects on Covered Species

Most of the covered activities occurring in the rights-of-way of canals adjacent to desert habitat would not affect habitat quality or quantity, and the primary concern is the potential for covered species to be injured by equipment used for O&M activities. As a result, the Desert Habitat Conservation Strategy focuses on minimizing the potential for covered species to be injured by activities along canals adjacent to desert habitat. However, the strategy includes provisions to protect habitat if IID's activities remove native desert vegetation. Because little or no change in the quality or availability of habitat, and few incidences of take of covered species are expected as a result of the covered activities, no adverse effects to covered species associated with desert habitat would be expected. Rather, by minimizing the potential for take of covered species and ensuring that any habitat lost or degraded by the covered activities is mitigated, implementation of the Desert Habitat Conservation Strategy would offset the impacts to the covered species associated with desert habitat. The effects of implementing the Desert Habitat Conservation Strategy on each of the covered species associated with desert habitat is provided below.

As part of the Monitoring and Adaptive Management Program (Chapter 4), IID could implement a survey or study program requiring capture of covered species. Capture of covered species constitutes take under both the federal and state ESAs. Take that occurs in association with surveys or studies conducted for this HCP is a covered activity and will be authorized under the state and federal ITPs. Any of the covered species could be taken through surveys or studies.

Studies and surveys conducted during the course of this HCP will be developed by IID in coordination with the HCP IT and will be subject to the approval of CDFG and USFWS prior to implementation. In approving the studies/surveys, the CDFG and USFWS will require capture methods that minimize the potential for death and injury of covered species. In addition, these agencies will specify the number of individuals of covered species that may be captured. Thus, the level of take authorized to occur through this mechanism will be specified on a case-by-case basis through the approval of the CDFG and USFWS.

#### 3.6.6.1 Desert Tortoise

Desert tortoise have the potential to occur in creosote bush scrub habitat within the rights-of-way of the AAC and East Highline Canal. About 60 miles of the AAC is adjacent to desert habitat. For about 10 miles, however, the AAC traverse the Algodones Dunes which do not provide potentially suitable habitat for desert tortoises. The East Highline Canal is adjacent to desert habitat that is potentially suitable for desert tortoises for about 40 miles. This habitat is marginal for the species because the diversity and abundance of perennial and annual grasses upon which it feeds is relatively low, and the area is subject to ongoing disturbance associated with canal maintenance activities and offroad recreational vehicle use. Although the HCP area is within this species' known range, desert tortoises have not been reported in the vicinity of the AAC or East Highline Canal.

Several covered activities have the potential to directly or indirectly take desert tortoises. The primary mechanism through which IID's activities could result in take of a desert tortoises is vehicle strikes during O&M or construction activities. IID workers drive along the canals on a daily basis to perform O&M and construction activities and desert tortoises could be struck by vehicles. Tortoises also will seek the shade under parked vehicles and could be injured when a parked vehicle is moved. Along the East Highline Canal, most vehicle travel is on the agricultural side of the canal where IID's facilities are located. Desert tortoises would not be expected to occur on the agricultural side of the canal and therefore the potential for take of tortoises through vehicle strikes along the East Highline Canal is minimal. Because vehicle traffic along the AAC occurs in areas adjacent to desert habitat, the potential for tortoises to be impacted is greater than along the East Highline Canal, although the potential for and magnitude of take is expected to be low, given the apparent low level of use of the HCP area by desert tortoises.

In addition to potentially being struck by vehicles as workers travel along the canals, performance of other O&M activities could impact desert tortoise. Roadways along the AAC are graded annually and along the East Highline several times a year. Vegetation control is conducted regularly on the canal embankments of the AAC and is anticipated to be conducted annually along the abandoned portion of the AAC in the future. The potential for desert tortoises to be struck by vehicles during the conduct of these activities is low because the vehicles performing these activities travel at a very slow speed such that desert tortoises would be able to move out of harm's way. Vegetation control is not conducted on the desert

side of the East Highline Canal, and therefore the potential for desert tortoises to be impacted by vegetation control or embankment grading is further reduced. Because IID tightly controls vegetation on its canals such that suitable habitat conditions for desert tortoises do not develop, vegetation control activities would not be expected to adversely affect desert tortoises through habitat changes.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC and East Highline Canal at least once. Construction to replace structures and potentially install canal lining could result in take of a desert tortoise through removal of habitat, destruction of burrows or strikes by equipment used during construction. Over the term of the permit, scheduled construction activities will not permanently remove more than 100 acres of native desert habitat. Only a portion of this habitat would be potentially suitable for desert tortoises and given this species' low level of use of the HCP area, the potential for and extent of take occurring as a result of habitat reduction is low.

Under the Desert Habitat Conservation Strategy, IID would implement measures to avoid and minimize the potential for desert tortoises to be killed or injured during O&M (Desert Habitat –2) and scheduled construction activities (Desert Habitat–3). Key avoidance measures for O&M activities include:

- Restricting activities to previously disturbed areas where use by covered species including desert tortoises is limited
- Taking actions to reduce the possibility that desert tortoises are struck by vehicles (e.g., checking under parked vehicles prior to moving the vehicle)
- Maintaining roads and embankments free of vegetation to discourage use by covered species including desert tortoises

For scheduled construction activities, IID will conduct preconstruction surveys to determine if desert tortoises occur within the construction area and implement practices to remove tortoises (e.g., conduct clearance surveys, excavate burrows) from the construction site and discourage use of site during construction activities (e.g., erect exclusion fencing). The requirements Desert Habitat–2 and –3 were derived from avoidance and minimization measures typically required by the USFWS and CDFG for desert tortoises and other special-status desert species. For scheduled construction activities, IID also will implement species-specific measures for desert tortoises (see Appendix C) consistent with the avoidance and minimization measures typically required by the USFWS and CDFG for construction activities. In combination, the practices for O&M and construction activities will minimize the potential for desert tortoises to be killed or injured as a result of these activities.

Scheduled construction activities could permanently remove up to 100 acres of native desert habitat and temporarily disturb a limited amount of native desert habitat, some of which could be habitat for desert tortoises. To offset impacts to desert tortoises potentially resulting from removal of native desert habitat, IID will restore native desert habitat that is temporarily disturbed during construction. By restoring the disturbed habitat, IID will reinstate the area's habitat values for the covered species, including desert tortoise. For habitat disturbed by construction activities that cannot be restored in situ, IID will acquire and protect in perpetuity native desert habitat at a 1:1 ratio for the acreage of habitat permanently lost because of construction. The habitat to acquire will be identified in consideration of which covered species use the habitat that is lost and will be managed for the benefit of covered

species in perpetuity. The HCP IT will be actively involved in identifying properties for acquisition and the USFWS and CDFG must approve properties that IID proposes for acquisition to fulfill the requirements of Desert Habitat–5. It is anticipated that the HCP IT will recommend and the USFWS and CDFG will approve acquisition of properties that provide the greatest possible value to the covered species impacted by the construction activities in terms of the property's habitat value and location to other important areas for the species.

The HCP area provides only marginal habitat quality for desert tortoises and the species' occurrence in the HCP area is low. As a result of this low level of use and with implementation of minimization measures, the potential for and extent of take of desert tortoises from O&M and construction activities is very low. With the long-term protection and management of native desert habitat, impacts to desert tortoises from reduced habitat would be offset. With the very low level of potential take and measures to offset take that could occur, implementation of the HCP would not jeopardize the continued existence of the species.

#### 3.6.6.2 Colorado Desert Fringe-Toed Lizard

Suitable habitat for the Colorado Desert fringe-toed lizard in the HCP area occurs where the AAC traverses the Algodones Dunes and the Sand Fields in East Mesa. The AAC is adjacent to the Algodones Dunes for about 10 miles and the Sand Fields for about 20 miles. Colorado Desert fringe-toed lizards have been reported in surveys along this portion of the AAC (Reclamation and IID 1994).

Several covered activities have the potential to directly or indirectly take Colorado Desert fringe-toed lizards. The primary mechanism through which IID's activities could result in take of a lizard is vehicle strikes during O&M or construction activities. IID workers drive along the AAC on a daily basis to perform O&M and construction activities and Colorado Desert fringe-toed lizards could be struck by vehicles. The risk to this species is limited to the 10-mile section of the AAC that traverses the Algodones Dunes and approximately 20-mile sections that traverses the Sand Fields. These lizards also may seek the shade under parked vehicles and could be injured when the vehicle is moved.

In addition, to potentially being struck by vehicles as workers travel along the canals, performance of other O&M activities could impact Colorado Desert fringe-toed lizards. Roadways along the AAC are graded annually. Vegetation control is conducted regularly on the canal embankments of the AAC and is anticipated to be conducted annually along the abandoned portion of the AAC in the future. Every 5 years, IID also removes vegetation from three seepage recovery systems adjacent to the AAC and lizards basking on the roadway could be struck by the excavator. The potential for Colorado Desert fringe-toed lizard to be struck by vehicles during the conduct of these activities is low because the vehicles travel at a very slow speed such that individuals would be able to move out of harm's way. However, during periods when these lizards are inactive, they are vulnerable.

Along the portion of the AAC that traverses the Algodones Dunes, IID annually knocks down portions of the sand dunes, creating a flatter slope that allows sand to blow across the canal. In conducting this flattening, a dozer drags an I-beam back and forth across the peaks of the dunes to level them. The area where this activity is conducted begins at the Coachella Turnout (Sta. 1907+20) and extends to about Sidewinder Road at Pilot Knob (Sta. 1243+65), a distance

of 12.56 miles. The area actually disturbed is about 50 to 75 feet wide yielding a total acreage disturbed of 76 to 114 acres. This acreage represents less than 0.1 percent of the 150,000 acres of the Algodones Dunes that provide habitat for this species. Colorado Desert fringe-toed lizards could be taken during the course of these activities.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace structures could result in take of a Colorado Desert fringe-toed lizard through removal of habitat or being struck by equipment used during construction. Over the term of the permit, scheduled construction activities will not permanently remove more than 100 acres of native desert habitat. Impacted habitat would be distributed along the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals that are adjacent to desert habitat. Potential habitat for Colorado Desert fringe-toed lizards in the HCP area is limited to the 30 miles of the AAC in the Algodones Dunes and Sand Fields. Thus, the potential loss of habitat for Colorado Desert fringe-toed lizard would be considerably less than 100 acres.

Under the Desert Habitat Conservation Strategy, IID would implement measures to avoid and minimize the potential for Colorado Desert fringe-toed lizards to be killed or injured during O&M (Desert Habitat–2) and scheduled construction activities (Desert Habitat–3). Key avoidance measures for O&M activities include:

- Restricting activities to previously disturbed areas where use by covered species including Colorado Desert fringe-toed lizards is expected to be limited
- Taking actions to reduce the possibility that lizards are struck by vehicles (e.g., checking under parked vehicles prior to moving the vehicle)

For scheduled construction activities, IID will conduct preconstruction surveys to determine if Colorado Desert fringe-toed lizards occur within the construction area. If this species is found in the construction area or is likely to occur IID will implement species-specific measures for Colorado Desert fringe-toed lizards in addition to those required under Desert Habitat–3 (See Appendix C). Minimization and avoidance practices include identifying and remove lizards from the construction site (e.g., conducting clearance surveys, examining trenches prior to filling, conducting hourly inspections when surface temperatures exceed 30°C) and discouraging and/or monitoring use of the site by lizards during construction activities (e.g., erecting exclusion fencing, maintaining a biological monitor onsite). The requirements Desert Habitat–2 and –3 and in Appendix C were derived from avoidance and minimization measures typically required by the USFWS and CDFG for Colorado Desert fringe-toed lizards and other special-status desert species. In combination, the practices for O&M and construction activities will minimize the potential for Colorado Desert fringe-toed lizards to be killed or injured as a result of these activities.

Scheduled construction activities could permanently remove up to 100 acres of native desert habitat. To offset impacts to Colorado Desert fringe-toed lizard potentially resulting from removal of native desert habitat, IID will acquire and protect in perpetuity native desert habitat at a 1:1 ratio for the acreage of habitat permanently lost because of construction. The habitat to acquire will be identified in consideration of which covered species use the habitat that is lost and will be managed for the benefit of covered species in perpetuity. The HCP IT will be actively involved in identifying properties for acquisition and the USFWS and CDFG must approve properties that IID proposes for acquisition to fulfill the requirements of Desert

Habitat–5. It is anticipated that the HCP IT will recommend and the USFWS and CDFG will approve acquisition of properties that provide the greatest possible value to the covered species impacted by the construction activities in terms of the property's habitat value and location to other important areas for the species.

Covered activities conducted by IID have the potential to take Colorado Desert fringe-toed lizards in the immediate vicinity of he AAC. Habitat for Colorado Desert fringe-toed lizard in the HCP area constitutes a small portion of the habitat for this species in the Algodones Dunes. Under the HCP, IID will implement measures to minimize and avoid take of Colorado Desert fringe-toed lizards and compensate for any habitat reductions. IID has been conducting O&M and construction activities along the AAC for several decades and given the presence of fringe-toed lizards in areas adjacent to the AAC, the species appears capable of coexisting with IID's ongoing activities. Implementation of the HCP would serve to further reduce and offset impacts and therefore would not jeopardize the continued existence of Colorado Desert fringe-toed lizard.

#### 3.6.6.3 Western Chuckwalla

Western chuckwallas are associated with the Sonoran Creosote Bush Scrub plant community, but within this community it is restricted to areas with large rocks, boulders, or rocky outcrops, usually on slopes. Within the HCP area, creosote bush scrub is found within portions of the rights-of-way of the AAC, East Highline, Westside Main, Thistle, and Trifolium Extension canals. However, most of this the habitat is of marginal quality for western chuckwallas because it generally lacks rocky features. The most likely place for this species to occur in the HCP area is along the AAC near the LCR where the canal passes through a rocky canyon. Thus, use of the HCP area by this species is believed to be very low and restricted to a small area.

Several covered activities have the potential to directly or indirectly take western chuckwallas. The primary mechanism through which IID's activities could result in take of a chuckwalla is vehicle strikes during O&M or construction activities. IID workers drive along the AAC on a daily basis to perform O&M and construction activities and chuckwallas could be struck by vehicles. Western chuckwallas also may seek the shade under parked vehicles and could be injured when the vehicle is moved. The risk to this species is low because suitable habitat for this species adjacent to the IID's canals is believed to be restricted to a small area along the AAC.

In addition, to potentially being struck by vehicles as workers travel along the canals, performance of other O&M activities could impact western chuckwallas. Roadways along the AAC are graded annually. Vegetation control is conducted regularly on the canal embankments of the AAC and is anticipated to be conducted annually along the abandoned portion of the AAC in the future. Every 5 years, IID also removes vegetation from three seepage recovery systems adjacent to the AAC and chuckwallas basking on the roadway could be struck by the excavator. The potential for chuckwallas to be struck by vehicles during the conduct of these activities is low because the vehicles travel at a very slow speed such that individuals would be able to move out of harm's way.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC Construction to replace structures could result in take of a western chuckwalla through removal of habitat or being struck by equipment used during construction. Over the term of

the permit, scheduled construction activities will not permanently remove more than 100 acres of native desert habitat. Impacted habitat would be distributed along the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals that are adjacent to desert habitat. Potential habitat for chuckwallas is limited to a small section of the AAC. Thus, the potential loss of habitat for western chuckwallas would be considerably less than 100 acres.

Under the Desert Habitat Conservation Strategy, IID would implement measures to avoid and minimize the potential for western chuckwallas to be killed or injured during O&M (Desert Habitat–2) and scheduled construction activities (Desert Habitat–3). Key avoidance measures for O&M activities include:

- Restricting activities to previously disturbed areas where use by covered species, including chuckwallas, is expected to be limited
- Taking actions to reduce the possibility that chuckwallas are struck by vehicles (e.g., checking under parked vehicles prior to moving the vehicle)
- Maintaining roads and embankments free of vegetation to discourage use by covered species including western chuckwallas

For scheduled construction activities, IID will conduct preconstruction surveys to determine if chuckwallas occur within the construction area. If this species is found in the construction area or is likely to occur IID will implement species-specific measures for western chuckwallas in addition to those required under Desert Habitat–3 (see Appendix C). Minimization and avoidance practices include identifying and removing chuckwallas from the construction site (e.g., conducting clearance surveys, examining trenches prior to filling) and discouraging and/or monitoring use of the site by chuckwallas during construction activities (e.g., erecting exclusion fencing, maintaining a biological monitor onsite). The requirements Desert Habitat–2 and –3 and in Appendix C were derived from avoidance and minimization measures typically required by the USFWS and CDFG for other special-status reptiles associated with desert habitat (e.g., desert tortoises, fringe-toed lizards, flat-tailed horned lizards). In combination, the practices for O&M and construction activities will minimize the potential for chuckwallas to be killed or injured as a result of these activities.

Scheduled construction activities could permanently remove up to 100 acres of native desert habitat. To offset impacts to chuckwallas potentially resulting from removal of native desert habitat, IID will acquire and protect in perpetuity native desert habitat at a 1:1 ratio for the acreage of habitat permanently lost because of construction. The habitat to acquire will be identified in consideration of which covered species use the habitat that is lost and will be managed for the benefit of covered species in perpetuity. The HCP IT will be actively involved in identifying properties for acquisition and the USFWS and CDFG must approve properties that IID proposes for acquisition to fulfill the requirements of Desert Habitat–5. It is anticipated that the HCP IT will recommend and the USFWS and CDFG will approve acquisition of properties that provide the greatest possible value to the covered species impacted by the construction activities in terms of the property's habitat value and location to other important areas for the species.

The HCP area provides only marginal habitat quality for western chuckwallas and supports only a small amount of potential habitat. Thus, the species' occurrence in the HCP area is low. As a result of this low level of use and with implementation of minimization measures, the

potential for and extent of take of western chuckwallas from O&M and construction activities is very low. With the long-term protection and management of native desert habitat, impacts to western chuckwallas from reduced habitat would be offset. With the very low level of potential take and measures to offset take that could occur, implementation of the HCP would not jeopardize the continued existence of the species.

#### 3.6.6.4 Couch's Spadefoot Toad

No records of Couch's spadefoot toad exist for the HCP area, but it is within the species' range. It is uncertain if suitable habitat conditions are present in the HCP area. Couch's spadefoot toads could use native desert habitats within the right-of-way of the AAC and use seepage communities associated with the AAC or East Highline Canal for breeding. Surveys conducted under the Desert Habitat Conservation Strategy will provide information on the presence of suitable habitat and this species in the HCP area.

This species rarely occurs above ground. Up to 10 months out of the year, it remains within burrows located in friable soil associated with desert plants. Because the ground is compacted and plant cover is minimal, these toads are not likely to burrow in portions of the rights-of-way where IID conducts its activities. Toads could be struck by vehicles when they move to and from breeding ponds. The potential for take and the magnitude of take of spadefoot toads in this manner is low because Couch's spadefoot toads are only active for a very brief period of time in association with rain storms (less than one month). Although the potential for take from O&M activities is low, IID will implement a suite of measures to minimize direct injury and mortality to covered species associated with desert habitat (Desert Habitat–2 and –3). The habitat and covered species surveys conducted under Desert Habitat–4 will provide information on the occurrence and distribution of Couch's spadefoot toads and their habitat in the HCP area. The HCP IT will use this information to improve minimization and avoidance measures as described in Chapter 4 Monitoring and Adaptive Management.

Of greater concern is the potential for construction activities to eliminate breeding ponds. Installation of seepage recovery systems on the East Highline Canal are not expected to impact Couch's spadefoot toads because the recovery systems are proposed for the west side of the canal and desert habitat occurs on the east side of the canal. Seepage communities on the east side of the East Highline Canal which are adjacent to desert habitat would not be affected by the proposed seepage recovery systems.

Along the AAC, scheduled construction activities could remove up to 100 acres of native desert habitat. Potentially, ponds suitable for breeding by Couch's spadefoot toads could occur along the AAC and some of the 100 acres of potentially impacted by construction could support breeding ponds. Potential breeding ponds will be identified as part of the baseline habitat surveys and use by spadefoot toads determined when conditions are appropriate (e.g., in association with thunderstorms).

Breeding ponds are a critical habitat feature for Couch's spadefoot toads. Because of the believed scarcity of suitable ponds and uncertainty about the number and distribution of suitable ponds in the HCP area, IID will obtain written approval from the USFWS and CDFG if it proposes to impact a breeding pond. In deciding whether to approve the request, the USFWS and CDFG will consider the availability of other breeding ponds in the HCP area and the overall status of the species. The baseline surveys will provide the information

necessary for USFWS and CDFG to determine whether a breeding pond could be eliminated (e.g., number, size, and location of breeding ponds) without causing substantial adverse effects to the species.

To mitigate the impact to Couch's spadefoot toads from removal of breeding ponds, if approved by the USFWS and CDFG, IID would acquire, protect, and manage in perpetuity two breeding ponds for every pond impacted. With the requirement for IID to receive approval from the USFWS and CDFG prior to eliminating a breeding pond and the requirement to protect two ponds for every one impacted, the number of ponds that could be impacted will be limited. The long-term protection of breeding ponds in the event that a pond would be removed, would offset impacts to Couch's spadefoot toads by providing habitat for this species in perpetuity. Further, USFWS and CDFG would not approve removal of a pond if it would substantially adversely affect the species. Based on the believed low level of use of the HCP area by Couch's spadefoot toads the potential for take of this species is low. With implementation of measures to avoid and minimize impacts and strict conditions on removal of breeding ponds, implementation of the HCP would not jeopardize the continued existence of this species.

#### 3.6.6.5 Flat-Tailed Horned Lizard

Flat-tailed horned lizards are known to occur within the HCP area and suitable habitat for the species exists along the AAC and along the western side of the Westside Main Canal in the West Mesa. Habitat for this species also occurs to the east of the East Highline Canal (BLM 1990). The species is well distributed along the AAC although this area has not been identified as a key area for the species. Flat-tailed horned lizards typically occupy sandy, desert flatlands with sparse vegetation and low plant diversity.

Several covered activities have the potential to directly or indirectly take flat-tailed horned lizards. The primary mechanism through which IID's activities could result in take of a lizard is vehicle strikes during O&M or construction activities. IID workers drive along the AAC and other canals adjacent to desert habitat on a daily basis to perform O&M and construction activities and flat-tailed horned lizards could be struck by vehicles. Along the East Highline, Westside Main, Thistle, and Trifolium Extension canals, most vehicle travel is on the agricultural side of the canal where IID's facilities are located. Flat-tailed horned lizards would not be expected to occur on the agricultural side of the canal and therefore the potential for take of lizards through vehicle strikes along these other canals is minimal. Because vehicle traffic along the AAC occurs in areas adjacent to desert habitat, the potential for lizards to be impacted is greater than along the other canals. Flat-tailed horned lizards also may seek the shade under parked vehicles and could be injured when the vehicle is moved.

In addition to potentially being struck by vehicles as workers travel along the canals, performance of other O&M activities could impact flat-tailed horned lizards. Roadways along the AAC are graded annually and those along the other canals adjacent to desert habitat are graded several times a year. Vegetation control is conducted regularly on the canal embankments of the canals and is anticipated to be conducted annually along the abandoned portion of the AAC in the future. Vegetation control is not conducted on the desert side of the other canals adjacent to desert habitat and therefore the potential for flat-tailed horned lizards to be impacted by vegetation control or embankment grading is low. Every five years, IID also removes vegetation from three seepage recovery systems adjacent to the AAC and lizards

basking on the roadway could be struck by the excavator. Although these vehicles travel at a slow enough speed for flat-tailed horned lizards to avoid being struck, this lizard's response to a threat is to remain motionless. With this response, they are vulnerable to being killed or injured by machinery regardless of the speed it travels.

Along the portion of the AAC that traverses the Algodones Dunes, IID annually knocks down portions of the sand dunes, creating a flatter slope that allows sand to blow across the canal. In conducting this flattening, a dozer drags an I-beam back and forth across the peaks of the dunes to level them. The area where this activity is conducted begins at the Coachella Turnout (Sta. 1907+20) and extends to about Sidewinder Road at Pilot Knob (Sta. 1243+65), a distance of 12.56 miles. The area actually disturbed is about 50 to 75 feet wide, yielding a total acreage disturbed of 76 to 114 acres. Flat-tailed horned lizards could be taken during the course of these activities.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace structures could result in take of a flat-tailed horned lizard through removal of habitat or being struck by equipment used during construction. Over the term of the permit, scheduled construction activities will not permanently remove more than 100 acres of native desert habitat. Impacted habitat would be distributed along the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals adjacent to desert habitat.

Under the Desert Habitat Conservation Strategy, IID would implement measures to avoid and minimize the potential for flat-tailed horned lizards to be killed or injured during O&M (Desert Habitat–2) and scheduled construction activities (Desert Habitat–3). Key avoidance measures for O&M activities include:

- Restricting activities to previously disturbed areas where use by covered species including flat-tailed horned lizards is expected to be limited
- Taking actions to reduce the possibility that lizards are struck by vehicles (e.g., checking under parked vehicles prior to moving the vehicle)
- Maintaining roads and embankments free of vegetation to discourage use by covered species including flat-tailed horned lizards

For scheduled construction activities, IID will conduct preconstruction surveys to determine if flat-tailed horned lizards occur within the construction area. If this species is found in the construction area or is likely to occur, IID will implement species-specific measures for flat-tailed horned lizards in addition to those required under Desert Habitat–3 (see Appendix C). Minimization and avoidance practices include identifying and remove lizards from the construction site (e.g., conducting clearance surveys, examining trenches prior to filling, conducting hourly inspections when surface temperatures exceed 30°C) and discouraging and/or monitoring use of the site by lizards during construction activities (e.g., erecting exclusion fencing, maintaining a biological monitor onsite). The requirements for Desert Habitat–2 and –3 and in Appendix C were derived from avoidance and minimization measures typically required by the USFWS and CDFG for flat-tailed horned lizards and other special-status desert species. In combination, the practices for O&M and construction activities will minimize the potential for flat-tailed horned lizards to be killed or injured as a result of these activities.

Scheduled construction activities could permanently remove up to 100 acres of native desert habitat. To offset impacts to flat-tailed horned lizard potentially resulting from removal of native desert habitat, IID will acquire and protect in perpetuity native desert habitat at a 1:1 ratio for the acreage of habitat permanently lost because of construction. The habitat to acquire will be identified in consideration of which covered species use the habitat that is lost and will be managed for the benefit of covered species in perpetuity. The HCP IT will be actively involved in identifying properties for acquisition and the USFWS and CDFG must approve properties that IID proposes for acquisition to fulfill the requirements of Desert Habitat–5. It is anticipated that the HCP IT will recommend and the USFWS and CDFG will approve acquisition of properties that provide the greatest possible value to the covered species impacted by the construction activities in terms of the property's habitat value and location to other important areas for the species.

Covered activities conducted by IID have the potential to take flat-tailed horned lizards in the immediate vicinity of the several canals. Under the HCP, IID will implement measures to minimize and avoid take of flat-tailed horned lizards and compensate for habitat reductions. IID has been conducting O&M and construction activities along the AAC and other canals for several decades and given the continued presence of flat-tailed horned lizards in areas adjacent to IID's canals, the species appears capable of coexisting with IID's ongoing activities. Habitat loss to urban development and recreation, such as off-highway vehicle use, is the principal threat to species persistence (Zeiner et al. 1988). Implementation of the HCP which would serve to further reduce impacts attributable to IID's activities would not jeopardize the continued existence of flat-tailed horned lizards.

#### 3.6.6.6 Harris' Hawk

Cottonwood and mesquite trees that could provide potential nesting habitat for Harris' hawks occur in a few isolated seepage areas along the AAC, principally between Drops 3 and 4. Because of the limited amount of potential habitat for this species in the HCP area, its occurrence in the HCP area is very low.

The potential for Harris' hawks to be disturbed or injured as a result of the covered activities is low. Harris' hawks are probably most likely to occur in the HCP area in the seepage community between Drops 3 and 4 on the AAC. This community contains cottonwoods and mesquite that could be used for nesting with adjacent desert scrub, a commonly used habitat for foraging. O&M activities would not affect this community and no construction activities affecting that seepage area are anticipated under this HCP. Scheduled construction activities could remove up to 100 acres of native desert habitat. The most common habitat adjacent to the AAC and the other canals that abut desert habitat is creosote scrub. This habitat is not suitable for nesting habitat by Harris' hawk but could be used for foraging. Potentially an individual Harris' hawk could be taken because of reduced foraging habitat. If any of the 100 acres of native desert habitat potentially removed because of construction contains mesquite trees, nesting birds could be impacted. This potential impact is considered remote given the scarcity of nesting opportunities along the AAC and other canals.

Under the Tamarisk Scrub Habitat Conservation Strategy and Desert Habitat Conservation Strategy, IID will survey areas that would be disturbed during construction to determine whether any covered species, including Harris' hawk, are breeding in habitat that would be

disturbed. Removal of habitat will be avoided until after the breeding season and native tree or desert habitat created or acquired to compensate for habitat that is permanently lost. These measures will minimize and mitigate any take of Harris' hawk as a result of construction activities. As explained under Section 3.4.6.11, the Tamarisk Scrub Habitat Conservation Strategy could benefit Harris' hawks through the creation/acquisition and long-term protection of native tree habitat. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of Harris' hawks.

### 3.6.6.7 Loggerhead Shrike

In the HCP area, habitat for loggerhead shrikes consists mainly of agricultural fields, although the species could also use desert habitats within rights-of-way of the AAC, East Highline, Westside Main, Thistle, and Trifolium Extension nesting and foraging. O&M activities within the rights-of-way of these canals could disturb loggerhead shrike nesting in desert habitat within the rights-of-way. The potential for disturbance and adverse effects from disturbance is low because O&M activities are restricted to previously disturbed areas, principally roads, and are not conducted immediately adjacent to potential habitat. Also, O&M activities conducted along these canals consist of vegetation control, roadway grading, and embankment maintenance. In conducting these activities, equipment is moved progressively along the canal such that it would not be in one location for an extended period of time where it could cause prolonged disturbance.

Scheduled construction activities could remove up to 100 acres of native desert habitat, some of which could be used by loggerhead shrike. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). If shrikes were nesting in habitat removed by construction, take could occur through nest destruction.

Under the Desert Habitat Conservation Strategy, IID will limit O&M activities to previously disturbed areas. With this restriction, IID will avoid reducing habitat for loggerhead shrikes and minimize the potential for disturbance or injury of individuals from O&M activities. For construction activities, IID will implement species-specific measures to avoid and minimize potential impacts to loggerhead shrike, such as surveying for potential nesting habitat in and near the construction site, establishing buffers around nests, and prohibiting construction between February 1 through July 31, or until young have fledged (see Appendix C). Removal of habitat where loggerhead shrike are breeding would be conducted outside of the breeding season to avoid destroying nests and killing or injuring young. Native desert habitat would mitigated through the acquisition and protection of habitat at a 1:1 ratio for the impacted acreage.

As described in more detail under the Agricultural Field Habitat Conservation Strategy (see Section 3.8.6.14), the Drain, Tamarisk Scrub, Salton Sea, Desert Habitat, and Agricultural Field Habitat Conservation Strategy all would contribute to providing habitat for loggerhead shrikes over the term of the permit. In combination, these strategies would mitigate any take of loggerhead shrikes potentially occurring and would not jeopardize the continued existence of the species.

### 3.6.6.8 Le Conte's Thrasher

The creosote bush scrub community in the AAC right-of-way and adjacent to the East Highline, Westside Main, Thistle, and Trifolium Extension canals provides potential habitat for the Le Conte's thrasher. The species is reported as an extirpated breeder at the Salton Sea NWR (USFWS 1997), but breeding pairs have been observed in desert scrub habitat east of the Coachella Canal, suggesting the potential for it to occur in desert scrub habitat within the AAC and East Highline Canal right-of-way. The primary reason for species decline is habitat loss attributable to degradation, fragmentation, agricultural conversion, urbanization, oil and gas development, fire, and over-grazing.

O&M activities within the rights-of-way of these canals could disturb Le Conte's thrashers nesting in desert habitat within the rights-of-way. The potential for disturbance and adverse effects from disturbance is low because O&M activities are restricted to previously disturbed areas, principally roads, and are not conducted immediately adjacent to potential habitat. Also, O&M activities conducted along these canals consist of vegetation control, roadway grading and embankment maintenance. In conducting these activities, equipment is moved progressively along the canal such that it would not be in one location for an extended period of time where it could cause prolonged disturbance.

Scheduled construction activities could remove up to 100 acres of native desert habitat, some of which could be used by Le Conte's thrashers. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). Because of the abundance of desert habitat in areas surrounding the HCP area and the small amount of habitat that would be permanently impacted by construction activities (up to 100 acres) over the term of the permit, the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal. However, if thrashers were nesting in habitat removed by construction, take could occur through nest destruction.

Under the Desert Habitat Conservation Strategy, IID will limit O&M activities to previously disturbed areas. With this restriction, IID will avoid reducing habitat for Le Conte's thrashers and minimize the potential for disturbance or injury of individuals from O&M activities. For construction activities, IID will implement species-specific measures to avoid and minimize potential impacts to Le Conte's thrashers such as surveying for potential nesting habitat in and near the construction site, establishing buffers around nests, and prohibiting construction until young have fledged (see Appendix C). Removal of habitat where Le Conte's thrashers are breeding would be conducted outside of the breeding season to avoid destroying nests and killing or injuring young. Permanent removal of native desert habitat would be mitigated through the acquisition and long-term protection of habitat at a 1:1 ratio for the impacted acreage.

Implementation of the HCP measures would minimize and mitigate the impact of take of Le Conte's thrashers that could result from the covered activities and would not jeopardize the continued existence of this species. Based on: (1) the small amount of habitat potentially impacted, (2) the availability of habitat in and around the HCP area, and (3) implementation of measures to minimize take of thrashers, the potential for take and the magnitude of take of Le Conte's thrashers as a result of the covered activities is low. Acquisition and long-term protection and management of native desert habitat would provide high-quality habitat for

Le Conte's thrashers in perpetuity. This long-term protection of native habitat would ensure the availability of nesting, roosting and foraging habitat for Le Conte's thrashers. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of Le Conte's thrashers.

### 3.6.6.9 Crissal Thrasher

The crissal thrasher occupies dense thickets of shrubs or low trees in desert riparian and desert wash habitats. Limited stands of mesquite, willow, and cottonwoods found in seepage areas of the AAC or adjacent to the East Highline could provide habitat for the species. The species is resident to Imperial, Coachella, and Borrego Valleys. Breeding pairs have been observed along the Alamo River and near the towns of Niland and Brawley (USGS Breeding Bird Surveys), and across from the mission wash flume 3 miles north-northeast of Bard and in areas around the Laguna Dam. Removal of mesquite brushland for agricultural production and introduction of tamarisk are the primary causes of population reductions, followed by habitat degradation and disturbance from offroad vehicle activity.

O&M activities within the rights-of-way of these canals disturb crissal thrashers nesting in desert habitat within the rights-of-way. The potential for disturbance and adverse effects from disturbance is low because O&M activities are restricted to previously disturbed areas, principally roads, and are not conducted immediately adjacent to potential habitat. Also, O&M activities conducted along these canals consist of vegetation control, roadway grading and embankment maintenance. In conducting these activities, equipment is moved progressively along the canal such that it would not be in one location for an extended period of time where it could cause prolonged disturbance.

Scheduled construction activities could remove up to 100 acres of native desert habitat, some of which could be used by crissal thrashers. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). Because of the abundance of desert habitat in areas surrounding the HCP area and the small amount of habitat that would be permanently impacted by construction activities (up to 100 acres) over the term of the permit, the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal. However, if thrashers were nesting in habitat removed by construction, take could occur through nest destruction.

Under the Desert Habitat Conservation Strategy, IID will limit O&M activities to previously disturbed areas. With this restriction, IID will avoid reducing habitat for crissal thrasher and minimize the potential for disturbance or injury of individuals from O&M activities. For construction activities, IID will implement species-specific measures to avoid and minimize potential impacts to crissal thrasher such as surveying for potential nesting habitat in and near the construction site, establishing buffers around nests, and prohibiting construction until young have fledged (see Appendix C). Removal of habitat where crissal thrashers are breeding would be conducted outside of the breeding season to avoid destroying nests and killing or injuring young. Permanent removal of native desert habitat would be mitigated through the acquisition and long-term protection of habitat at a 1:1 ratio for the impacted acreage.

Implementation of the HCP measures would minimize and mitigate the impact of take of crissal thrashers that could result from the covered activities and would not jeopardize the continued existence of this species. Based on: (1) the small amount of desert habitat potentially impacted, (2) the availability of habitat in and around the HCP area, and (3) implementation of measures to minimize take of thrashers, the potential for take and the magnitude of take of crissal thrashers as a result of the covered activities in desert habitat is low. Acquisition and long-term protection and management of native desert habitat would provide high quality habitat for crissal thrashers in perpetuity. This long-term protection of native habitat would ensure the availability of nesting, roosting and foraging habitat for crissal thrashers. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of crissal thrashers. Creation/acquisition of native tree habitat under the Tamarisk Scrub Habitat Conservation Strategy (see Section 3.4.6.12) and Salton Sea Conservation Strategy would further ensure the availability of habitat for this species in the HCP area.

### 3.6.6.10 Golden Eagle

Golden eagles occur in the HCP only as accidentals during the winter and spring. Much of the HCP area could be used by golden eagles for foraging; however, golden eagles are most likely to concentrate foraging activities in areas of high prey concentrations. In the HCP area, the Salton Sea and managed marsh at the state and federal wildlife refuges, as well as private duck clubs, attract abundant waterfowl populations during winter. Agricultural fields also attract waterfowl and golden eagles may forage in desert habitat as well. With the abundance of waterfowl at the Salton Sea and adjacent refuges, the potential for and level of take of golden eagles as a result changes in desert habitat would be minimal. However, over the term of the permit, a few golden eagles could be taken as a result of changes in foraging opportunities associated with agricultural fields. Take of golden eagles could result from reductions in agricultural fields; this potential effect is evaluated in Section 3.8.6.18.

Scheduled construction activities could remove up to 100 acres of native desert habitat, some of which could be used by golden eagle for foraging. Under the Desert Habitat Conservation Strategy, IID will acquire and protect native desert habitat to compensate for permanent loss of desert habitat. The long-term protection of native desert habitat would provide long-term certainty for golden eagles of the availability of foraging opportunities. In combination with the Drain (see Section 3.5.6.12) and Agricultural Field Habitat (see Section 3.8.6.18) Conservation Strategies, the minimal amount of take of golden eagles occurring from the covered activities in the HCP area would be mitigated, and implementation of the HCP would not jeopardize the continued existence of the species.

### 3.6.6.11 Elf Owl

The elf owl population in California has declined to low levels, such that it currently is only known from a few locations along the LCR and some isolated locations in Riverside County. Given the low population size and limited distribution, it is very unlikely that elf owls would occur in the HCP area. Thus, the potential for take of elf owls is very low.

The potential for elf owl to be disturbed or injured as a result of the covered activities is also low. The seepage community along the AAC between Drops 3 and 4 is the most likely place where elf owls would occur in the HCP area given its closer proximity to the LCR than the

Imperial Valley and the presence of adjacent desert scrub habitat. For nesting, elf owls appear to prefer forest habitat bordering desert habitat, conditions that exist in this seepage community. No construction activities affecting that seepage area are anticipated under this HCP.

Scheduled construction activities could remove up to 100 acres of native desert habitat. The most common habitat adjacent to the AAC and the other canals that abut desert habitat is creosote scrub. This habitat is not suitable for nesting habitat by elf owls but could be used for foraging. Potentially an individual elf owl could be taken because of reduced foraging habitat. Some of the 100 acres of native desert habitat potentially removed because of construction could be suitable for nesting by elf owls yielding a possibility of impacts to nesting birds. This potential impact is considered remote given the scarcity of nesting opportunities along the AAC and other canals adjacent to desert habitat.

Under the Tamarisk Scrub Habitat Conservation Strategy and Desert Habitat Conservation Strategy, IID will survey areas that would be disturbed during construction to determine if any covered species, including elf owls, are breeding in habitat that would be disturbed. Removal of habitat will be avoided until after the breeding season and native tree or desert habitat created or acquired to compensate for habitat that is permanently lost. These measures will minimize and mitigate any take of elf owls as a result of construction activities. As explained under Section 3.4.6.14, the Tamarisk Scrub Habitat Conservation Strategy could benefit elf owls through the creation/acquisition and long-term protection of native tree habitat. With the take minimization measures and compensation for take potentially resulting from reduced habitat, implementation of the HCP would not jeopardize the continued existence of elf owls.

### 3.6.6.12 Prairie Falcon

Prairie falcons are rare migrants in the HCP area; about 30 migrants occur in the valley each year (IID, 1994). Foraging habitat for prairie falcons in the HCP area consists of desert habitat, agricultural fields, and the shoreline of the Salton Sea. This species predominantly preys on small birds.

The covered activities are unlikely to adversely affect prairie falcons because of the low level of use of the HCP area by this species and its broad habitat use for foraging. However, a few individuals could be taken because of changes in foraging habitat availability or quality potentially resulting from permanent or temporary reductions in drain vegetation (see Section 3.5.2.2), permanent or temporary reductions in tamarisk scrub habitat (see Section 3.4.2), permanent reduction in desert habitat (see Desert Habitat–5), or changes in the composition and amount of agricultural field habitat (see Section 3.8.2). Although the ecology of the Salton Sea will change as the salinity of the sea increases, shorebirds would be expected to continue to use the sea and adjacent habitats.

The minimal amount of potential take would be mitigated by implementation of the Salton Sea, Tamarisk Scrub Habitat, Drain Habitat, Desert Habitat, and Agricultural Field Habitat conservation strategies. Loss of tamarisk scrub habitat at the Salton Sea and in the Imperial Valley would be offset through the creation/acquisition and long-term protection of native tree habitat (see Sections 3.3.4.2 and 3.4.5). By attracting a variety of songbirds, native tree habitat would provide higher quality foraging opportunities for prairie falcons. Critical to

the perpetuation of agriculture field habitat in the Imperial Valley where prairie falcon could forage is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for prairie falcons. The Drain Habitat Conservation Strategy also would contribute to mitigating the impact of any take of prairie falcons that could occur by increasing foraging opportunities through creation of managed marsh habitat. At maximum, 100 acres of desert habitat would be permanently impacted. Under the Desert Habitat Conservation Strategy, native desert habitat would be acquired, protected, and managed in perpetuity for covered specie to offset reductions in desert habitat. In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.6.6.13 Nelson's Bighorn Sheep

Bighorn sheep are known to use desert scrub habitat, however, their occurrence in the HCP area is unlikely given the lack of adjacent mountainous regions for use as escape and breeding habitat, and high level of human activity in the project area. Nelson's bighorn sheep occur in the Chocolate Mountains and Little Pichacho Mountains (CDFG 1999b).

The primary mechanism through which the covered activities could impact Nelson's bighorn sheep is through removal of desert habitat. Scheduled construction activities could remove up to 100 acres of native desert habitat. Depending on the location of this habitat, a portion could be used by Nelson's bighorn sheep. Potentially a few individual bighorn sheep could be taken as a result of reduced foraging habitat in the HCP area over the term of the permit. However, because of the low level of use of the HCP area by bighorn sheep, the potential for and level of take would be very low. Permanent removal of native desert habitat would be mitigated through the acquisition and long-term protection and management of habitat at a 1:1 ratio for the impacted acreage.

Implementation of the HCP measures would minimize and mitigate the impact of take of Nelson's bighorn sheep that could result from the covered activities and would not jeopardize the continued existence of this species. Based on: (1) the low level of use of the HCP area by bighorn sheep, (2) the small amount of habitat potentially impacted, and (3) the availability of habitat in and around the HCP area, the potential for take and the magnitude of take of Nelson's bighorn sheep as a result of the covered activities is very low. Acquisition and long-term protection and management of native desert habitat would provide high-quality habitat for bighorn sheep in perpetuity. With this long-term protection of habitat, implementation of the HCP would not jeopardize the continued existence of Nelson's bighorn sheep.

### 3.6.6.14 Peirson's Milk-Vetch

Habitat for Peirson's milk-vetch in the HCP area is limited to the AAC right-of-way where the AAC crosses the Algodones Dunes. This species has been found along the AAC where the canal traverses the Algodones Dunes (USFWS 1996b).

The only O&M activity likely to impact Peirson's milk-vetch is the canal maintenance IID conducts along the portion of the AAC that traverses the Algodones Dunes. IID annually knocks down portions of the sand dunes, creating a flatter slope that allows sand to blow

across the canal. In conducting this flattening, a dozer drags an I-beam back and forth across the peaks of the dunes to level them. The area where this activity is conducted begins at the Coachella Turnout (Sta. 1907+20) and extends to about Sidewinder Road at Pilot Knob (Sta. 1243+65), a distance of 12.56 miles. The area actually disturbed is about 50 to 75 feet wide yielding a total acreage disturbed of 76 to 114 acres. This acreage represents less than 0.1 percent of the 150,000 acres of the Algodones Dunes that provide habitat for this species. Peirson's milk-vetch could be uprooted as a result of this activity. The remaining O&M activities are restricted to previously disturbed areas (i.e., roadways and canal embankments) where Peirson's milk-vetch would not be expected to occur because these areas consist of well compacted soil that is not suitable for this species.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace structures could remove Peirson's milk-vetch. Over the term of the permit, scheduled construction activities will not permanently remove more than 100 acres of native desert habitat. Impacted habitat would be distributed along the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals that are adjacent to desert habitat. Potential habitat for Peirson's milk-vetch in the HCP area is limited to the 10 miles of the AAC in the Algodones Dunes. Thus, the potential loss of habitat for Peirson's milk-vetch would be considerably less than 100 acres.

Under the Desert Habitat Conservation Strategy, IID would implement measures, both general and plant-specific, to avoid and minimize impacts from O&M and construction activities. For O&M activities, workers would be instructed to restrict activities to previously disturbed areas so as to minimize intrusions into dune habitats where this species could occur. For construction, specific measures include preconstruction surveys, prohibiting surface disturbance within a prescribed radius of the species if it is found within the construction area, and transplanting individuals if impacts are unavoidable and transplanting is deemed appropriate by USFWS and CDFG (see Appendix C for a full listing of measures). General measures include familiarizing workers with covered plant species they are likely to encounter within the right-of-way and instructing them to avoid injuring or uprooting plants. IID also will restore any native vegetation temporarily impacted by construction and compensate for unavoidable and permanent impacts to vegetation by acquiring or granting a conservation easement on land at a 1:1 ratio for the acreage impacted.

Covered activities conducted by IID have the potential to take Peirson's milk-vetch in the immediate vicinity of the AAC. Habitat for Peirson's milk-vetch in the HCP area constitutes a small portion of the total habitat for this species in the Algodones Dunes. Under the HCP, IID will implement measures to minimize and avoid take of individual plants, transplant individuals if take cannot be avoided, and compensate for reductions in suitable habitat. IID has been conducting O&M and construction activities along the AAC for several decades and given the continued presence of this plant in areas adjacent to the AAC, the species appears capable of coexisting with IID's ongoing activities. Implementation of the HCP would serve to further reduce and offset impacts and would not jeopardize the continued existence of Peirson's milk-vetch.

### 3.6.6.15 Algodones Dunes Sunflower

Habitat for Algodones Dunes sunflower in the HCP area is limited to the AAC right-of-way where the AAC crosses the Algodones Dunes. This subspecies occurs where the AAC traverses the Algodones Dunes. The Algodones Dunes sunflower is naturally limited throughout its range by the availability of suitable dune habitat and is considered to be rare throughout its range. The main distribution of populations is within the Algodones Dunes system and, secondarily, in the Yuma dunes in Arizona. These stands are not large in numbers of individuals, but they are significant in maintaining genetic flow between populations in California and Arizona.

The only O&M activity with the potential to impact Algodones Dunes sunflower is the canal maintenance IID conducts along the portion of the AAC that traverses the Algodones Dunes. IID annually knocks down portions of the sand dunes, creating a flatter slope that allows sand to blow across the canal. In conducting this flattening, a dozer drags an I-beam back and forth across the peaks of the dunes to level them. The area where this activity is conducted begins at the Coachella Turnout (Sta. 1907+20) and extends to about Sidewinder Road at Pilot Knob (Sta. 1243+65), a distance of 12.56 miles. The area actually disturbed is about 50 to 75 feet wide yielding a total acreage disturbed of 76 to 114 acres. This acreage represents less than 0.1 percent of the 150,000 acres of the Algodones Dunes that provide habitat for this species. Algodones Dunes sunflower could be uprooted as a result of this activity. The remaining O&M activities are restricted to previously disturbed areas (i.e., roadways and canal embankments) where Algodones Dunes sunflower would not be expected to occur, because these areas consist of well-compacted soil that is not suitable for this species.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace structures could remove Algodones Dunes sunflower. Over the term of the permit, scheduled construction activities will not permanently remove more than 100 acres of native desert habitat. Impacted habitat would be distributed along the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals that are adjacent to desert habitat. Potential habitat for Algodones Dunes sunflower in the HCP area is limited to the 10 miles of the AAC in the Algodones Dunes. Thus, the potential loss of habitat for Algodones Dunes sunflower would be considerably less than 100 acres.

Under the Desert Habitat Conservation Strategy, IID would implement measures, both general and plant-specific, to avoid and minimize impacts from O&M and construction activities. For O&M activities, workers would be instructed to restrict activities to previously disturbed areas so as to minimize intrusions into dune habitats where this species could occur. For construction, specific measures include preconstruction surveys, prohibiting surface disturbance within a prescribed radius of the species if it is found within the construction area, and transplanting individuals if impacts are unavoidable and transplanting is deemed appropriate by USFWS and CDFG (see Appendix C for a full listing of measures). General measures include familiarizing workers with covered plant species they are likely to encounter within the right-of-way and instructing them to avoid injuring or uprooting plants. IID also will restore any native vegetation temporarily impacted by construction and compensate for unavoidable and permanent impacts to vegetation by

acquiring or granting a conservation easement on land at a 1:1 ratio for the acreage impacted.

Covered activities conducted by IID have the potential to take Algodones Dunes sunflower in the immediate vicinity of the AAC. Habitat for Algodones Dunes sunflower in the HCP area constitutes a small portion of the total habitat for this species in the Algodones Dunes. Under the HCP, IID will implement measures to minimize and avoid take of individual plants, transplant individuals if take cannot be avoided and to compensate for reductions in suitable habitat. IID has been conducting O&M and construction activities along the AAC for several decades and given the continued presence of this plant in areas adjacent to the AAC, the species appears capable of coexisting with IID's ongoing activities. Therefore, implementation of the HCP which would serve to further reduce impacts and would not jeopardize the continued existence of Algodones sunflower.

#### 3.6.6.16 Wiggin's Croton

Habitat for Wiggin's croton in the HCP area is limited to the right-of-way of the AAC where it crosses the Algodones Dunes. Several populations of the species have been found in and near the AAC right-of-way, and results of a 1993 survey by IID and Reclamation indicated occurrences of this species within the high dunes system as well as isolated populations in the smaller dunes.

The only O&M activity with the potential to impact Wiggin's croton is the canal maintenance IID conducts along the portion of the AAC that traverses the Algodones Dunes. IID annually knocks down portions of the sand dunes, creating a flatter slope that allows sand to blow across the canal. In conducting this flattening, a dozer drags an I-beam back and forth across the peaks of the dunes to level them. The area where this activity is conducted begins at the Coachella Turnout (Sta. 1907+20) and extends to about Sidewinder Road at Pilot Knob (Sta. 1243+65), a distance of 12.56 miles. The area actually disturbed is about 50 to 75 feet wide yielding a total acreage disturbed of 76 to 114 acres. This acreage represents less than 0.1 percent of the 150,000 acres of the Algodones Dunes that provide habitat for this species. Wiggin's croton could be uprooted as a result of this activity. The remaining O&M activities are restricted to previously disturbed areas (i.e., roadways and canal embankments) where Wiggin's croton would not be expected to occur because these areas consist of well compacted soil that is not suitable for this species.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace structures could remove Wiggin's croton. Over the term of the permit, scheduled construction activities will not permanently remove more than 100 acres of native desert habitat. Impacted habitat would be distributed along the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals that are adjacent to desert habitat. Potential habitat for Wiggin's croton in the HCP area is limited to the 10 miles of the AAC in the Algodones Dunes. Thus, the potential loss of habitat for Wiggin's croton would be considerably less than 100 acres.

Under the Desert Habitat Conservation Strategy, IID would implement measures, both general and plant-specific, to avoid and minimize impacts from O&M and construction activities. For O&M activities, workers would be instructed to restrict activities to previously disturbed areas so as to minimize intrusions into dune habitats where this

species could occur. For construction, specific measures include preconstruction surveys, prohibiting surface disturbance within a prescribed radius of the species if it is found within the construction area, and transplanting individuals if impacts are unavoidable and transplanting is deemed appropriate by USFWS and CDFG (see Appendix C for a full listing of measures). General measures include familiarizing workers with covered plant species they are likely to encounter within the right-of-way and instructing them to avoid injuring or uprooting plants. IID also will restore any native vegetation temporarily impacted by construction and compensate for unavoidable and permanent impacts to vegetation by acquiring or granting a conservation easement on land at a 1:1 ratio for the acreage impacted.

Covered activities conducted by IID have the potential to take Wiggin's croton in the immediate vicinity of the AAC. Habitat for Wiggin's croton in the HCP area constitutes a small portion of the total habitat for this species in the Algodones Dunes. Under the HCP, IID will implement measures to minimize and avoid take of individual plants, transplant individuals if take cannot be avoided and to compensate for reductions in suitable habitat. IID has been conducting O&M and construction activities along the AAC for several decades and given the continued presence of this plant in areas adjacent to the AAC, the species appears capable of coexisting with IID's ongoing activities. Therefore, implementation of the HCP which would serve to further reduce impacts and would not jeopardize the continued existence of Wiggin's croton.

#### 3.6.6.17 Giant Spanish Needle

In California, giant Spanish needle species is restricted to southeastern Imperial County, where it is primarily found in the Algodones Dunes System. Habitat for the species in the HCP area occurs in the right-of-way of the AAC where the AAC traverses the Algodones Dunes and this species has been found within the AAC right-of-way. The giant Spanish needle is not considered to be endangered, but the species is under potential threat from military activities; offroad vehicle use, habitat degradation, direct impacts resulting from infrastructure improvements (highways and utilities), and quarry and stockpile operations.

The only O&M activity with the potential to impact giant Spanish needle is the canal maintenance IID conducts along the portion of the AAC that traverses the Algodones Dunes. IID annually knocks down portions of the sand dunes, creating a flatter slope that allows sand to blow across the canal. In conducting this flattening, a dozer drags an I-beam back and forth across the peaks of the dunes to level them. The area where this activity is conducted begins at the Coachella Turnout (Sta. 1907+20) and extends to about Sidewinder Road at Pilot Knob (Sta. 1243+65), a distance of 12.56 miles. The area actually disturbed is about 50 to 75 feet wide yielding a total acreage disturbed of 76 to 114 acres. This acreage represents less than 0.1 percent of the 150,000 acres of the Algodones Dunes that provide habitat for this species. Giant Spanish needle could be uprooted as a result of this activity. The remaining O&M activities are restricted to previously disturbed areas (i.e., roadways and canal embankments) where giant Spanish needle would not be expected to occur because these areas consist of well compacted soil that is not suitable for this species.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace structures could remove giant Spanish needle. Over the term of the permit, scheduled construction activities will not permanently remove more than 100 acres

of native desert habitat. Impacted habitat would be distributed along the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals that are adjacent to desert habitat. Potential habitat for giant Spanish needle in the HCP area is limited to the 10 miles of the AAC in the Algodones Dunes. Thus, the potential loss of habitat for giant Spanish needle would be considerably less than 100 acres.

Under the Desert Habitat Conservation Strategy, IID would implement measures, both general and plant-specific, to avoid and minimize impacts from O&M and construction activities. For O&M activities, workers would be instructed to restrict activities to previously disturbed areas so as to minimize intrusions into dune habitats where this species could occur. For construction, specific measures include preconstruction surveys, prohibiting surface disturbance within a prescribed radius of the species if it is found within the construction area, and transplanting individuals if impacts are unavoidable and transplanting is deemed appropriate by USFWS and CDFG (see Appendix C for a full listing of measures). General measures include familiarizing workers with covered plant species they are likely to encounter within the right-of-way and instructing them to avoid injuring or uprooting plants. IID also will restore any native vegetation temporarily impacted by construction and compensate for unavoidable and permanent impacts to vegetation by acquiring or granting a conservation easement on land at a 1:1 ratio for the acreage impacted.

Covered activities conducted by IID have the potential to take giant Spanish needle in the immediate vicinity of the AAC. Habitat for giant Spanish needle in the HCP area constitutes a small portion of the total habitat for this species in the Algodones Dunes. Under the HCP, IID will implement measures to minimize and avoid take of individual plants, transplant individuals if take cannot be avoided, and compensate for reductions in suitable habitat. IID has been conducting O&M and construction activities along the AAC for several decades and given the continued presence of this plant in areas adjacent to the AAC, the species appears capable of coexisting with IID's ongoing activities. Therefore, implementation of the HCP which would serve to further reduce impacts and would not jeopardize the continued existence of giant Spanish needle.

### 3.6.6.18 Sand Food

The sand food is a perennial root parasite that occurs on sand dunes or in sandy areas in association with creosote scrub at elevations below 650 feet above sea level. Habitat for the species in the HCP area is restricted to the right-of-way of the AAC where it crosses the Algodones Dunes. The species was observed near the proposed AAC parallel canal during 1994 surveys. This species is considered rare throughout its range, and is limited by the availability of suitable habitat and host plants, both of which have been reduced in extent or degraded by various land uses, including military and recreational vehicular activities, bulldozing and clearing of native dune vegetation, agriculture, and invasion of dunes by nondune species.

The only O&M activity with the potential to impact sand food is the canal maintenance IID conducts along the portion of the AAC that traverses the Algodones Dunes. IID annually knocks down portions of the sand dunes, creating a flatter slope that allows sand to blow across the canal. In conducting this flattening, a dozer drags an I-beam back and forth across the peaks

of the dunes to level them. The area where this activity is conducted begins at the Coachella Turnout (Sta. 1907+20) and extends to about Sidewinder Road at Pilot Knob (Sta. 1243+65), a distance of 12.56 miles. The area actually disturbed is about 50 to 75 feet wide yielding a total acreage disturbed of 76 to 114 acres. This acreage represents less than 0.1 percent of the 150,000 acres of the Algodones Dunes that provide habitat for this species. Sand food could be uprooted as a result of this activity. The remaining O&M activities are restricted to previously disturbed areas (i.e., roadways and canal embankments) where sand food would not be expected to occur because these areas consist of well compacted soil that is not suitable for this species.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC Construction to replace structures could remove sand food. Over the term of the permit, scheduled construction activities will not permanently remove more than 100 acres of native desert habitat. Impacted habitat would be distributed along the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals that are adjacent to desert habitat. Potential habitat for sand food in the HCP area is limited to the 10 miles of the AAC in the Algodones Dunes. Thus, the potential loss of habitat for sand food would be considerably less than 100 acres.

Under the Desert Habitat Conservation Strategy, IID would implement measures, both general and plant-specific, to avoid and minimize impacts from O&M and construction activities. For O&M activities, workers would be instructed to restrict activities to previously disturbed areas so as to minimize intrusions into dune habitats where this species could occur. For construction, specific measures include preconstruction surveys, prohibiting surface disturbance within a prescribed radius of the species if it is found within the construction area, and transplanting individuals if impacts are unavoidable and transplanting is deemed appropriate by USFWS and CDFG (see Appendix C for a full listing of measures). Because it is parasitic on creosote bush, individual sand food plants would need to be transplanted along with its host plant. General measures include familiarizing workers with covered plant species they are likely to encounter within the right-of-way and instructing them to avoid injuring or uprooting plants. IID also will restore any native vegetation temporarily impacted by construction and compensate for unavoidable and permanent impacts to vegetation by acquiring or granting a conservation easement on land at a 1:1 ratio for the acreage impacted.

Covered activities conducted by IID have the potential to take sand food in the immediate vicinity of the AAC. Habitat for sand food in the HCP area constitutes a small portion of the total habitat for this species in the Algodones Dunes. Under the HCP, IID will implement measures to minimize and avoid take of individual plants, transplant individuals if take cannot be avoided, and compensate for reductions in suitable habitat. IID has been conducting O&M and construction activities along the AAC for several decades and given the continued presence of this plant in areas adjacent to the AAC, the species appears capable of coexisting with IID's ongoing activities. Therefore, implementation of the HCP would serve to further reduce impacts and would not jeopardize the continued existence of sand food.

# 3.7 Species-Specific Conservation Strategies

## 3.7.1 Burrowing Owls

Burrowing owls commonly inhabit the earthen banks of agricultural canals and drains in the HCP area. Drain and canal maintenance activities have the potential to affect burrowing owls. These routine activities can trap owls in their burrows or injure individuals. Construction activities such as reservoir construction and canal structure projects can adversely affect burrowing owls in similar ways. If concentrated near an occupied burrow, construction activities also can disturb owls and potentially lead to nest abandonment.

Although individual owls can be at risk to injury or disturbance, maintenance activities are ultimately beneficial to owls. Burrowing owls require sparsely vegetated areas with friable soil suitable for burrowing by burrowing mammals. Drain and canal maintenance activities create these conditions as vegetation is removed and friable soils are maintained. The high availability of suitable burrow locations provided by the drains and canals, adjacent to foraging habitat provided by the agricultural fields contributes to the maintenance of a high population of owls in the Imperial Valley. As such, the Burrowing Owl Conservation Strategy focuses on continuing the activities that provide suitable habitat conditions for burrowing owls, while minimizing the potential to take individuals. The overall biological goal of the Burrowing Owl Conservation Strategy is to maintain a self-sustaining population of burrowing owls across the current range of the owl encompassed by the HCP area. The specific objective is to maintain adequate burrow availability and community parameters (e.g., burrowing mammals, foraging habitat), to the extent that IID can influence these parameters, at levels to support the initial distribution and relative abundance of owls on lands covered by the HCP and affected by the covered activities. The specific actions that IID will undertake to achieve this objective are detailed below. These measures apply throughout the HCP area, including the rights-of-way of the AAC, East Highline, and Westside Main Canals.

***Owl–1.*** *IID will implement a worker education program. Workers responsible for drain cleaning or conveyance system maintenance will be required to attend a worker education program to ensure proper implementation of the HCP measures addressing burrowing owls. Workers will be instructed on the requirements of the HCP within six months of issuance of the incidental take permit. The worker education program will be conducted at least annually to ensure instruction of new employees and as a refresher. For new workers, IID will ensure that they are informed of and understand the HCP requirements prior to conducting drain cleaning or conveyance system maintenance activities either individually or through the annual education program.*

- *The worker education program will instruct workers on the identification and habitat use of burrowing owls. Workers will be instructed to exercise care when operating in areas inhabited by burrowing owls so as to avoid injuring owls. Workers will be required to report any observations of dead or injured burrowing owls.*

- *The worker education program also will provide instruction on drain cleaning procedures required by the HCP (see Owl–2 and Owl–3) and procedures for conducting conveyance system maintenance (see Owl–4 and Owl–5). A worker education manual will be prepared and distributed to each person conducting drain cleaning or conveyance system maintenance activities. The manual will include a photograph/drawing of a burrowing owl and brief information on its identification. The manual also will summarize the HCP's requirements for drain cleaning and conveyance system maintenance for easy reference. Concurrence of the manual will be gained from the USFWS and CDFG. The manual will be reviewed annually and updated as appropriate.*

The primary concern for burrowing owls relates to O&M activities. The effectiveness of avoidance and minimization measures (Owl–2, Owl–3, Owl–4, and Owl–5) will depend on workers being able to recognize burrowing owls and understand the requirements of the HCP with respect to burrowing owls. A worker education program is critical to ensuring that measures are implemented properly and the benefits to burrowing owls are realized.

***Owl–2**. Immediately prior to initiating drain or canal cleaning operations, the equipment operator will make a visual inspection of banks to identify burrows in the section to be cleaned. The equipment operator will look for burrows from the side of the drain/canal opposite the side where the equipment will be operated. The location of burrows will be indicated with paint or other temporary method for reference during drain cleaning. All burrows of suitable size for burrowing owls will be identified and avoidance measures followed regardless of use by burrowing owls. In conducting drain/canal cleaning,*

- *The operator will avoid collapsing or filling burrows.*
- *The operator will exercise care in removing sediment from the drain/canal and depositing spoils on the bank so as to avoid moving the excavator bucket directly over a burrow.*

*The HCP Implementation Biologist and maintenance workers will work together to develop standard operating procedures for drain and canal cleaning. The standard operating procedures will be developed within one year of issuance of the incidental take permit and refined and updated based on monitoring results (see Chapter 4). Workers will be instructed in the standard operating procedures through the worker education program (Owl–1).*

To minimize the potential for drain and canal cleaning activities to impact individual owls, the workers conducting this maintenance will inspect areas to be cleaned and avoid burrows during their cleaning operations. The primary concern for drain and canal cleaning activities is the potential for an occupied burrow to be filled or collapsed resulting in entrapment of owls in the burrow. Drain and canal cleaning activities have the potential to fill or collapse burrows if vegetation and soil are removed in the immediate vicinity of the burrow or if sediment falls from the bucket as the excavator operator swings the bucket from the drain bottom to the drain bank. Under this measure, these potential effects will be avoided or minimized. All burrows, regardless of occupancy by owls, will be treated in this manner, thus avoiding impacts to owls inhabiting the burrows at the time of drain or canal cleaning and maintaining the availability of burrows for future use.

As part of the worker education program (Owl–1), workers will be instructed on the identification of owls and their burrows as well as standard operating procedures for drain and canal cleaning developed under Owl–2. The worker education program will ensure that

workers can identify burrows suitable for burrowing owls, understand the requirements under Owl–2, and know the proper techniques for cleaning drains and canals in areas supporting burrowing owls.

***Owl–3.*** *When grading spoils from drain or canal cleaning, the soil to be graded will first be rolled away from the channel and broken up into small clods and slowly rolled back towards the channel. Care will be taken to not roll the soil back down the slope.*

When drains and canals are cleaned, the spoils are deposited on the roadway adjacent to the drain or canal. After the spoils have dried, they are graded to a level surface. Owls inhabiting burrows in the drain bank can be trapped in their burrow if the spoils are allowed to roll down the drain bank and block the burrow entrances. This measure reduces the potential for this impact to occur. Workers conducting the drain or canal cleaning will be instructed (Owl–1) in the appropriate techniques for grading spoils as part of the worker education program.

***Owl–4.*** *Burrows in drain and canal banks will be left undisturbed where they do not compromise the integrity of the channel embankment or channel lining. When burrows must be filled to maintain the integrity of the channel, the corrective actions will be conducted during October through February. Prior to filling a burrow, the HCP Implementation Biologist will ensure that owls are not present in the burrow by using one of the techniques detailed in Appendix D.*

In the HCP area, burrowing owls often inhabit burrows in canal banks behind concrete lining on the canals. If burrows become large, they can weaken the concrete lining or the canal embankment and ultimately cause lining failures and leaks in the canal. Similarly, drain embankments can be weakened by burrows. IID fills in burrows to prevent the development of leaks and more costly repairs as part of its O&M activities on the conveyance and drainage system. Under this measure, IID will allow burrows to persist in canal and drain banks as long as they do not jeopardize the integrity of the lining or embankment. As part of the worker education program (Owl–1), workers will be instructed on the conditions under which a burrow poses a threat to a channel's integrity and when burrows do not pose a threat and, therefore, are to be left undisturbed. Through this measure, IID will reduce impacts of conveyance and drainage system maintenance activities on owls and burrow availability, and promote persistence of burrowing owls in the HCP area.

***Owl–5.*** *Prior to replacing facilities or constructing new facilities, workers will coordinate with the HCP Implementation Biologist. Replacement and construction of facilities consists of installing system-based water conservation measures, rerouting drains and canals, replacing concrete lining on canals, conducting seepage maintenance, and replacing structures. The workers will inform the biologist of the location and type of work required and work with the biologist to schedule the work. The biologist will determine if burrows occupied by burrowing owls would be filled or collapsed by the required work. If occupied burrows would be affected, the work will be scheduled to occur during October through February. Prior to conducting the work, the HCP Implementation Biologist will ensure that owls are not present in the burrow by using one of the techniques detailed in Appendix D. If no occupied burrows are found, the burrows will be made inaccessible to owls and work can proceed at any time.*

In the HCP area, burrowing owls often inhabit burrows in canal embankments or in association with structures required to convey irrigation and drainage water. Sections of concrete lining need to be replaced to prevent or repair leaks and to maintain the smooth flow of water. When leaks occur, embankments need to be cored and new material added to

repair the embankment. Structures need to be replaced periodically to maintain proper functioning of the conveyance and drainage systems. Burrows can be filled in conducting these actions and owls occupying burrows in these areas can be killed or injured.

Other covered activities that could fill or collapse burrows and impact owls are:

- Installation of canal lining
- Installation of lateral interceptors and reservoirs
- Installation of seepage recovery systems
- Canal rerouting
- Drain rerouting

As explained below, these activities are expected to have only minor effects on burrowing owls.

About 537 miles of IID's canal system are currently unlined. IID could pursue lining the unlined portions of the conveyance system during the permit term. Although lining the remaining unlined portions of the canal system could displace many owls, only 1.74 miles of canals currently have been identified for lining under the water conservation and transfer program. Rosenberg and Haley (2001) estimated the density of burrowing owls in Imperial Valley at 4.7 pairs/mile. Based on this estimate, lining 1.74 miles of canal could displace 16 owls (8 pairs) and temporarily reduce burrow availability. After the lining is completed, burrowing mammals would be expected to create new burrows along the newly lined canal and replace any burrows impacted during the lining process.

Lateral interceptors and reservoirs would be installed in agricultural fields (see Figure 1.7-5). Burrows used by burrowing owls are located along drains and canals, rather than within an agricultural field. Because the new interceptors and canals would be located in agricultural fields, the potential for impacts to burrowing owls is low. Construction of these new features could increase nesting opportunities for burrowing owls because additional canals (i.e., the lateral interceptors) would be constructed. Construction of the entire lateral interceptor system identified (see Table 1.7-3) would result in about 72 additional miles of canals. As burrows are created by burrowing mammals in the new canals, burrow availability for owls would increase.

Seepage recovery systems are contemplated along the East Highline Canal. Areas where seepage recovery systems would be installed probably provide poor habitat conditions for burrowing owls. The areas proposed for seepage recovery systems contain moist soils because of the seepage and most support dense vegetation (see Figure 2.3-6). These characteristics are not conducive to burrowing owls and no owls were observed in May 2001 when the proposed locations where visited. Thus, impacts to burrowing owls from installation of seepage recovery systems are expected to be low.

On average, IID reroutes about 0.25 mile of canal and about 0.2 mile of drains every year. In rerouting a canal or drain, the existing drain or canal is abandoned and a new drain or canal constructed. Abandonment of a canal or drain could result in the loss of burrows for owls. Assuming a density of 4.7 pairs/miles (Rosenberg and Haley 2001), about four owls (two pairs) could be displaced by drain and canal rerouting each year. Drain and canal rerouting would not result in a permanent loss of habitat for owls. The newly constructed drain or canal sections would replace the habitat lost from abandoning canal or drain sections.

Under this measure, the HCP Implementation Biologist and workers will work closely to ensure that owls are removed from the work area prior to the start of activities and repairs are scheduled to avoid the owl's breeding period. Thus, through this measure, IID will minimize the potential for take of owls by these activities.

***Owl–6.*** *IID will not change its current drain and canal maintenance techniques to techniques that are not compatible with burrowing owls. IID will not implement any drain and canal maintenance techniques that may affect burrowing owl habitat beyond those currently employed without receiving concurrence from USFWS and CDFG that the new techniques are compatible with the maintenance of burrowing owl habitat.*

Currently, IID's drain and canal maintenance activities create suitable habitat conditions for burrowing owls. Burrowing owls require sparsely vegetated areas with friable soil suitable for burrowing. Drain and canal maintenance activities create ideal locations for burrows because vegetation is removed and friable soils are maintained through embankment maintenance. As long as IID continues to follow existing practices for maintaining the drains and canals, these features will continue to provide suitable habitat conditions for burrowing mammals that create burrows for owls. However, during the 75-year permit term, new technologies or practices for drain and canal maintenance could be developed that are not compatible with burrowing mammals or burrowing owls. Incompatible practices include those that would eliminate friable soil or sparsely vegetated conditions along the canals or drains. By committing not to employ techniques that would reduce the availability or suitability of drains and canals for burrowing mammals, IID will perpetuate the conditions that make the HCP area favorable for burrowing owls. In the event that alternative drain and canal maintenance techniques or technologies become available during the term of the permit, IID will seek concurrence from USFWS and CDFG that the new techniques are compatible with maintaining habitat for burrowing mammals and burrowing owls. This will give IID the opportunity to take advantage of more efficient techniques and technologies in the future and provide USFWS and CDFG with the ability to ensure that maintenance techniques remain compatible with the biological objectives for burrowing owls.

***Owl–7.*** *IID will conduct a relative abundance and distribution survey for the entire HCP area (see Chapter 4). After the entire HCP area has been surveyed once (i.e., after 5 years), IID will conduct a demographic study of burrowing owls in the HCP area. The demographic study will continue for 12 to 15 years. The HCP IT will develop the study design and duration for the demographic study in consultation with a statistician.*

IID has been delivering water to farmers in the Imperial Valley and maintaining its drainage and conveyance system for over 75 years. The Imperial Valley supports one of the highest densities of burrowing owls and supports much higher densities than in nearby native desert habitat (Rosenberg and Haley 2001). These observations suggest that the high density of burrowing owls is a consequence of agriculture in combination with IID's drainage and conveyance system operation and maintenance. The burrowing owl population has persisted in the Imperial Valley for many years. Agriculture and IID's activities have made positive contributions to this persistence.

With this measure, IID will conduct a demographic study to assess the status of the burrowing owl population in the HCP area. Under the demographic study, several areas

within the HCP area will be intensively studied. The specific areas will be identified following results of the first complete relative abundance and distribution survey (see Chapter 4). The HCP Implementation Team will develop the final study design to develop a life table and annual growth rate (λ). The results of the demographic study will be used in the monitoring and adaptive management program (see Chapter 4).

***Owl–8.*** *For activities that would permanently eliminate burrows suitable for burrowing owls as determined by the HCP Implementation Biologist, IID will determine if owls are currently using burrows that would be impacted. If owls are not using burrows that would be impacted, the burrows will be made inaccessible to owls and the activity may proceed at any time. If owls are using burrows that would be impacted, IID will conduct the activity during October through February and prior to the start of the activity, the HCP Implementation Biologist will ensure that owls are not present in the burrows using one of the methods described in Appendix D. For every impacted burrow regardless of whether owls are currently using the burrows, IID will install two replacement burrows in areas deemed appropriate by the HCP IT.*

Covered activities with the potential to permanently eliminate burrows include:

- Converting an open drain into a pipeline drain
- Constructing control houses as part of facility automation
- Developing facilities to support fishing, wildlife viewing, picnicking, and related activities at IID facilities

Most of IID's drainage system consists of open drains. Burrowing owls commonly inhabit the inside banks of the drain. At a farmer's request, IID will install a pipeline to carry drain water thereby allowing the farmer to use the land occupied by the drain. Installing a pipeline to carry drain water eliminates existing burrows in the drain banks and prohibits the development of burrows in the future. Very little of the drainage system is in pipes, and minimal additional piping of drains is anticipated over the term of the permit.

As part of its system improvements, IID will automate operation of various structures. Automation includes construction of a control house and a surrounding gravel access and parking area. Less than a 1-acre area is disturbed for construction of these facilities. If burrows occur in the footprint of the control house and access/parking areas, they would be permanently lost as burrowing mammals could not recreate burrows within the footprint. In this event, the loss of burrows would be mitigated according to Owl–8. However, construction of control houses is not anticipated to eliminate burrows or to impact burrowing owls because: (1) IID will have flexibility in the exact location of the facilities and therefore will be able to avoid areas inhabited by owls, and (2) the facilities will be located outside of the embankments of the canals and drains and thereby avoid where most of the owl burrows occur.

Construction of recreational facilities also could result in the permanent loss of burrows. IID does not currently plan to construct additional recreational facilities but could do so over the term of the HCP. Potential new recreational facilities would be associated with IID's facilities and would consist of very small structures such as picnic tables, information kiosks, and restroom facilities. Furthermore, IID would have flexibility in locating new facilities or projects and would locate and design recreational facilities so as to avoid

impacts to owls. If new recreational facilities cannot be situated to avoid owl burrows, the loss of burrows would be mitigated according to Owl–8.

Under this measure, IID commits to taking actions to avoid, minimize, and compensate the potential effects to burrowing owls from activities that could reduce the availability of burrows. If occupied burrows will be impacted, IID will conduct the activities outside of the breeding season and remove owls from the burrows that would be impacted prior to initiating the activities. IID also will create two replacement burrows for every impacted burrow as recommended in the CDFG Staff Report on Burrowing Owl Mitigation (CDFG 1995). The availability of suitable burrows is generally believed to be a limiting factor for burrowing owls although burrow availability as a limiting factor has not been investigated in the Imperial Valley. By replacing burrows that would be impacted, IID will provide alternate habitat for displaced owls. Burrowing owls are known to use artificial nest burrows at the Salton Sea NWR (Gervais et al. 2000), so owls would be expected to colonize replacement burrows created by IID.

***Owl–9.*** *IID will implement a farmer and public education program on burrowing owls. Periodically, IID will include information on burrowing owls in water bills to farmers. The materials will provide information on the ecology and habitat use of burrowing owls, the benefits to farmers of burrowing owls in controlling agricultural pests, and farm management practices that are beneficial and detrimental to burrowing owls. IID also will make materials on burrowing owls available to the public and will take advantage of opportunities to conduct public outreach programs on burrowing owls. These materials will be prepared and distribution initiated within 1 year of issuance of the incidental take permit.*

In addition to the canals and drains maintained by IID, burrowing owls inhabit burrows along delivery ditches on private agricultural lands and use agricultural fields for foraging. By educating farmers on the benefits of burrowing owls in controlling agricultural pests and of farm management practices that are beneficial to owls, IID will contribute to the overall maintenance of burrowing owls in the HCP area. Educating the public also will contribute to maintenance of burrowing owls. For example, in Florida, Milsap and Bear (2000) found a decrease in nest failures due to harassment following implementation of a burrowing owl education program in the public schools.

#### 3.7.1.1 Effects on Burrowing Owls

Haug et al. (1993) reported that burrowing owls have declined in abundance throughout most of their range. In the western states, 54 percent of 24 jurisdictions reported burrowing owl populations decreasing, and there were no reported increases. More recent analyses suggest that burrowing owl populations in western and midwestern portions of North America have been increasing (Sheffield 1997). Based on breeding bird survey data, the burrowing owl population in the midwestern and western portion of the United States has increased about 2 percent during 1980 to 1994. During the same period, the western states showed a 4.2 percent increase, with the population in California increasing by 6.3 percent.

The trend in burrowing owl populations in California estimated from breeding bird surveys contrasts with findings of DeSante and Ruhlen (1995). They reported the results of surveys for burrowing owls conducted throughout California except for the Great Basin and desert areas during 1991 to 1993. The surveys indicated a 37 to 60 percent decrease in the number

of breeding groups since the early 1980s with the burrowing owl being extirpated from several counties (i.e., Marin, San Francisco, Santa Cruz, Napa Ventura, and coastal San Luis Obispo) and nearly extirpated from several additional counties (i.e., Sonoma, Orange, and coastal Monterey). Development is believed to have been the primary cause of the extirpation and decline of burrowing owls in these counties. However, they also found a nonsignificant increase in the number of pairs of burrowing owls of 3.1 percent between 1991 and 1992 and a significant increase in the number of pairs of 19 percent between 1992 and 1993. DeSante and Ruhlen (1995) attributed their results to losses of small breeding groups, but increases in the size of large breeding groups.

Burrowing owls occur at a very high density in the Imperial Valley. The density of burrowing owls in Imperial County surpasses that of any other single county (Reclamation and SSA 2000). A high density of burrowing owls also was noted in the late 1960s (Coulombe 1971). An estimated 6,429 pairs of burrowing owls inhabit the Imperial Valley representing 69 percent of the estimated total population in California (Shuford et al. 1999). This population level translates into a density of about 236 pairs per 60 square miles (DeSante and Ruhlen 1995). For comparison, the average density of burrowing owls in other lowland areas in California was estimated at 11.9 pairs per 60 square miles (DeSante and Ruhlen 1995).

The reasons for the very high density of burrowing owls in the Imperial Valley have not been determined. In the Imperial Valley, insects are the primary prey of burrowing owls (Coulombe 1971, Rosenberg et al. 2000) suggesting that the year-round agriculture in Imperial Valley could result in the area providing a consistently high biomass of insects. IID's extensive drain and canal system also could play a role in maintaining a high burrowing owl density in the Imperial Valley. Burrowing owls are dependent on burrows created by other agents. Rosenberg and Haley (2001) identified water seepage, muskrats, and gophers as the primary agents creating burrows used by burrowing owls in the Imperial Valley. Some burrows used by burrowing owls were formed by round-tailed ground squirrels. The banks of the canals and drains are maintained clear of vegetation, creating suitable conditions for burrow construction by burrowing mammals and owls commonly inhabit canal and drain banks. Hurlbert (1997) found the greatest number of burrowing owls along drains with the least amount of vegetation, although burrowing owls were present along all of the drains surveyed.

Drain and canal maintenance activities can pose a risk to burrowing owls, such as trapping owls in their burrows. In conducting mechanical vegetation control in drains, an excavator, operated from the drain bank, is used to scrape vegetation from the side and bottom of the drain in the channel bottom. Canal embankments are maintained free of vegetation by chaining, disking, side scraping, and use of Roundup®, Rodeo®, and Direx®.

Under the HCP, IID will implement a worker education program and commit to precautions to reduce the potential for owls to be injured during maintenance operations. Although individuals could be affected by drain and canal embankment maintenance activities, the population in the Imperial Valley is expected to remain at its currently high density for several reasons. First, burrowing owls occur at high densities in the Imperial Valley concurrently with drain and canal maintenance activities and the Imperial Valley has supported a high density of burrowing owls for several decades (Coulombe 1971; DeSante and Ruhlen 1995). Second, Hurlbert (1997) found a greater number of owls along drains with little vegetation suggesting

that drain maintenance activities that clear vegetation could overall be beneficial to burrowing owls. Drain banks and canal embankments free of vegetation are favorable to burrowing owls because they provide suitable burrowing locations as well as potentially reduce predation risk by eliminating cover for predators and edges where predators often forage (Warnock and James 1997). Third, IID only cleans about one-fifth of its drain system a year and drain maintenance is focused in areas with accumulations of vegetation or sediment, areas less likely to support large numbers of burrowing owls than bare banks. Thus, in any given year, most burrowing owls would be unaffected by drain maintenance activities. All of these factors suggest that existing drain maintenance practices are consistent with the persistence of burrowing owls in the Imperial Valley.

IID currently maintains canal and drain embankments free of vegetation through a combination of mechanical and chemical methods. These methods create barren banks that attract burrowing mammals that subsequently create burrows that burrowing owls use. While it is currently anticipated that IID will continue to use these methods for drain and canal maintenance, new technology or techniques could be developed in the future. Under the HCP, IID will commit to not changing drain and canal maintenance practices in a manner that would render canal and drain embankments unsuitable for burrowing mammals and burrowing owls. By not employing drain or canal maintenance practices that are incompatible with burrowing owls, IID will ensure that suitable conditions for burrows persist in the HCP area for the term of the permit.

### 3.7.2 Desert Pupfish

Desert pupfish have become established in many of the drains constructed and maintained by IID that discharge directly via gravity into the Salton Sea. Although IID routinely maintains adequate drainage in these channels by removing vegetation and sediment, these drains provide the habitat conditions (e.g., water quality, food source, and aquatic vegetation) necessary to support pupfish. IID's maintenance activities, while likely necessary to maintain the habitat characteristics necessary to support pupfish, have the potential to result in the incidental take of pupfish. In addition, implementation of water conservation projects has the potential to change water quality in the drains occupied by pupfish and to adversely affect pupfish. The potential effects of each of the covered activities on desert pupfish is presented in Table 3.7-1.

The biological goal of the desert pupfish conservation strategy is to maintain viable populations of desert pupfish in the HCP area. This will be accomplished by maintaining or increasing pupfish habitat in IID's drains relative to the current levels (i.e., no net loss) and to minimizing the potential for IID's drain maintenance and construction activities, and the water conservation program to result in the incidental take of desert pupfish. As previously described, this goal is augmented and supported by the Salton Sea measures designed to maintain connectivity among drain populations of pupfish and to promote recovery by establishing additional population refugium.

**TABLE 3.7-1**
Potential Effects of Covered Activities on Desert Pupfish

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| **Water Use and Conservation** | |
| Combined effects of on-farm and system-based water conservation | Water conservation would reduce flow in the drains. However, water elevation in the portion of the drains occupied by pupfish is near level and not controlled by flow. A decrease in flow to these portions of the drain would reduce water velocity but not water height or the wetted area of the drain. Water conservation would result in increased concentration of selenium in the drains, which could result in impairment of pupfish reproduction. |
| Combined effects of fallowing to conserve water | Fallowing to conserve water would reduce flow in drains; however, water quality (e.g., selenium concentrations) would not be affected. Because pupfish habitat in the drains is not controlled by flow and water quality would not change, water conservation through fallowing would not likely affect pupfish. |
| Installation of on-farm water conservation features | On-farm water conservation practices would be constructed within agricultural fields or their margins and therefore would not likely affect drain habitat or pupfish. |
| **Installation of System-based Water Conservation Features** | |
| Canal lining and piping | Canal lining or piping results in modifications to canals with no physical changes to the pupfish drains. Therefore, canal lining or piping would not likely affect desert pupfish. |
| Construction of new canals | New canals would be constructed through agricultural fields and would tie into the existing canal system. Modifications, if any, to drains would occur where a crossing was necessary for the canal and one did not already exist. The drains occupied by pupfish are located in the terminal portion of the drain system, downstream of the last delivery gate. Therefore, it is unlikely that new canals would be constructed in areas occupied by desert pupfish. |
| Lateral interceptors | Lateral interceptors would be constructed in agricultural fields but would cross some drains. The construction of lateral interceptors is not anticipated in the portions of drains occupied by pupfish. |
| Reservoirs | IID could construct up to 100 reservoirs 1 to 10 acres in size, and encompassing up to 1,000 acres. These reservoirs would be on agricultural lands or barren lands and would not impact drain habitat or pupfish.<br><br>Farmers are expected to construct 1- to 2-acre reservoirs to better regulate irrigation water. These reservoirs would be installed in agricultural fields and would not impact drain habitat or pupfish. |
| Seepage recovery systems | Seepage recovery systems are proposed along the East Highline Canal. Desert pupfish do not inhabit areas along the East Highline Canal and would not be affected by seepage recovery systems. |
| **Operation and Maintenance** | |
| Conveyance system operation | Conveyance system operation is limited to moving water through the canals to meet maintenance and customer needs. Other than the filling, draining and moving water through the canals, no physical effects are encompassed by conveyance system operation. No effects to drain habitat or desert pupfish would be expected. |

**TABLE 3.7-1**
Potential Effects of Covered Activities on Desert Pupfish

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| **Drainage System Operation** | |
| Rerouting or constructing new drains | IID reroutes or constructs about 2 miles of drains every 10 years. Newly constructed drains that discharge directly to the Salton Sea could increase habitat for desert pupfish. Rerouting drains would not change the amount of pupfish drain habitat; however, rerouting drains could result in the temporary reduction in vegetation in the drains during the period between abandonment of the old drain and when vegetation develops in the rerouted drain. Pupfish drains represent a small fraction (0.009) of the drainage system. If pupfish drains were rerouted in proportion to the overall drainage system, approximately 750 feet of pupfish drain would be rerouted over the 75-year term. |
| Piping drains | Over the 75-year term IID anticipates that about 50 miles of open drains would be pipelined, with an annual average of 0.67 mile of drain piping. Assuming pupfish drains would be piped in proportion to the overall drainage system, about 0.45 mile of pupfish drain would be piped. All pupfish habitat within drains converted to pipes would be lost. |
| Inspection activities | Potential effects of inspection activities would be limited to a minor potential for disturbance of covered species if they occur in the vicinity of structures at the time of inspection. Because pupfish habitat in the drains only occurs in the terminal portion of the system downstream of the last check, inspection activities likely would be restricted to only one location (i.e., the check structure) on each pupfish drain. |
| Canal lining maintenance | Canal lining maintenance consists of repairing the concrete lining of canals only with no physical changes to drains. Therefore, canal lining maintenance would not likely affect drain habitat or desert pupfish habitat. |
| Right-of-way maintenance<br>Embankment maintenance<br>Erosion maintenance | Along drains, right-of-way maintenance, including embankment and erosion maintenance is conducted in association with vegetation control/sediment removal along drains. Potential impacts to pupfish resulting from these activities are encompassed by those described under vegetation control. |
| Seepage maintenance | Seepage maintenance is conducted only along the canal system. Therefore, seepage maintenance would not likely affect drain habitat or desert pupfish. |
| Structure maintenance | IID estimates that about 100 drainage structures would be replaced each year throughout the drainage system. On average, less than one drain structure would be replaced each year in drains occupied by pupfish. Pupfish in the vicinity of the maintenance could be disturbed or injured if they remained in near the construction site. |
| Pipeline maintenance | Drain pipelines primarily occur in farm fields while conveyance system pipelines occur through developed areas. Neither of these areas support desert pupfish. |
| Reservoir maintenance | Reservoirs are located on the conveyance system. Desert pupfish are not associated with reservoirs; thus they would not be affected by reservoir maintenance. |
| Sediment removal | IID removes sediment from about 20 percent of the drains annually (about 3 miles of drains potentially occupied by desert pupfish). Sediment removal temporarily reduces vegetation in the drains, increases turbidity, and disrupts the drain substrate. Sediment removal activities in the pupfish drains have the potential to disturb or injure pupfish that are unable to avoid the equipment or that find the drain temporarily uninhabitable. |

**TABLE 3.7-1**
Potential Effects of Covered Activities on Desert Pupfish

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| Vegetation control | Vegetation control along canals focuses on removing moss and algae, and has little potential to affect desert pupfish in the drains. Desert pupfish are not expected to use canals because of the lack of vegetation, deep water, presence of predators, and high water velocity.<br><br>Along drains, mechanical and chemical methods are used to control vegetation. Mechanical and chemical control of vegetation is conducted in association with sediment removal described above. Periodic removal of vegetation from the drains, specifically moss and algae, could adversely affect pupfish through temporarily reducing foraging habitat. |
| New and Alamo river maintenance | IID dredges the deltas of the New and Alamo rivers about once every four years. Desert pupfish are not believed to use the New and Alamo river deltas; thus, pupfish would not be affected by the dredging operations. |
| Salton Sea dike maintenance | Salton Sea dike maintenance activities consist of replacing riprap, grooming embankments and repairing damaged sections of the dikes. Pupfish are not believed to inhabit the Salton Sea in areas adjacent to the dikes; thus dike maintenance is not expected to affect pupfish. |
| Gravel and rock quarrying | Gravel and rock quarries do not occur in drains or immediately adjacent pupfish habitat. Thus, quarrying would not affect desert pupfish. |
| Fish hatchery operation and maintenance | The fish hatchery is a developed facility and does not support habitat for desert pupfish. |
| Recreational facilities | Because new recreational facilities would not be constructed in the drain prism, construction of recreational facilities would not be expected to affect desert pupfish. The HCP does not cover take of covered species by recreationists. |

The specific goals of the desert pupfish strategy will be achieved by implementing measures that:

- Ensure that IID will operate and maintain its drainage system in a manner that will maintain current levels of pupfish drain habitat
- Minimize the effects of potential increases in the concentration of selenium and possible other contaminants in the drainage system resulting from water conservation
- Enhance the potential for increasing the amount of pupfish habitat in areas exposed as the Salton Sea recedes
- Examine the efficacy of modifying drain maintenance activities to reduce the potential for take of pupfish and adjust maintenance activities based on the findings
- Avoid or minimize the potential for take of pupfish by IID construction activities

***Pupfish–1.*** *IID will operate and maintain its existing drainage system in a manner that will maintain the amount of potential pupfish drain habitat currently available expressed as linear channel distance (i.e., no net loss of pupfish drain habitat). Currently available pupfish habitat will be defined as the portion of all IID drains and their tributaries that discharge directly to the sea from the downstream side of the first check. IID will continue to maintain at least that amount of pupfish habitat for the duration of the term of the ITPs. IID's obligation for maintaining current levels of pupfish habitat may be reduced if the HCP IT determines that portions of the defined drain sections do not contain suitable pupfish habitat.*

Various surveys conducted by CDFG and others have recorded the presence of desert pupfish in many of IID's drains that discharge directly to the Salton Sea and their tributaries (Sutton 1999). Although not native habitat, the drains provide aquatic habitat that supports pupfish and contributes to the persistence of pupfish populations in the Imperial Valley. Desert pupfish use of habitat within the drains that discharge into the Salton Sea likely is influenced by flow, water quality, vegetation, and possibly the disturbance regime established by IID's drain maintenance activities. Pupfish populations also are influenced by interactions with exotic species. Implementation of the water conservation program has the potential to influence these factors and to adversely affect the quality of pupfish habitat in the drains.

Under this measure, IID will help ensure that the amount of drain habitat currently available to pupfish will remain unchanged relative to current conditions. IID will accomplish this by operating and maintaining its drainage system in a manner that will encourage continued use of the drains by pupfish. Although the presence of pupfish in and among these drains is sporadic and variable, all drain segments extending upstream from their direct connection with Salton Sea to the first check (Figure 3.7-1) were considered potential habitat for the purpose of this measure. Based on this definition, IID's drainage system supports 13.8 miles of drain potentially used by desert pupfish.

***Pupfish–2.*** *IID will operate and maintain its drain channels in a manner that minimizes the effects of water conservation on water quality. Based on the findings of studies to determine the effects of selenium on pupfish conducted by the USFWS or others, IID will work with the HCP Implementation Team to determine within 2 years of completion of studies the best means for managing its drain channels to minimize potential selenium effects on pupfish. If the studies are not completed within 10 years, IID and the HCP IT will use available information to determine the best means for managing its drain channels to minimize potential selenium effects on pupfish. Measures to be adopted by IID may include: splitting combined drain channels (drain/operational water) to improve water quality; providing limited biological treatment, including use of discharge from managed marsh mitigation habitat; and consolidating channels and blending flows, and could be implemented on all of the pupfish drains if necessary.*

Selenium is a naturally occurring constituent of Colorado River water that is concentrated in drain water by evaporation and transpiration in the Imperial Valley prior to discharge into the Salton Sea. Implementation of the water conservation project has the potential to influence the concentration of selenium and other contaminants in the drains occupied by desert pupfish. Under an option where fallowing is used as the mechanism for conserving water, selenium concentrations are projected to decrease on average in the pupfish drains from a baseline concentration of 4.8 ppb to 4.61 ppb (see Water Quality section of the IID *Water Conservation and Transfer Project Draft EIR/EIS*). However, water conservation options

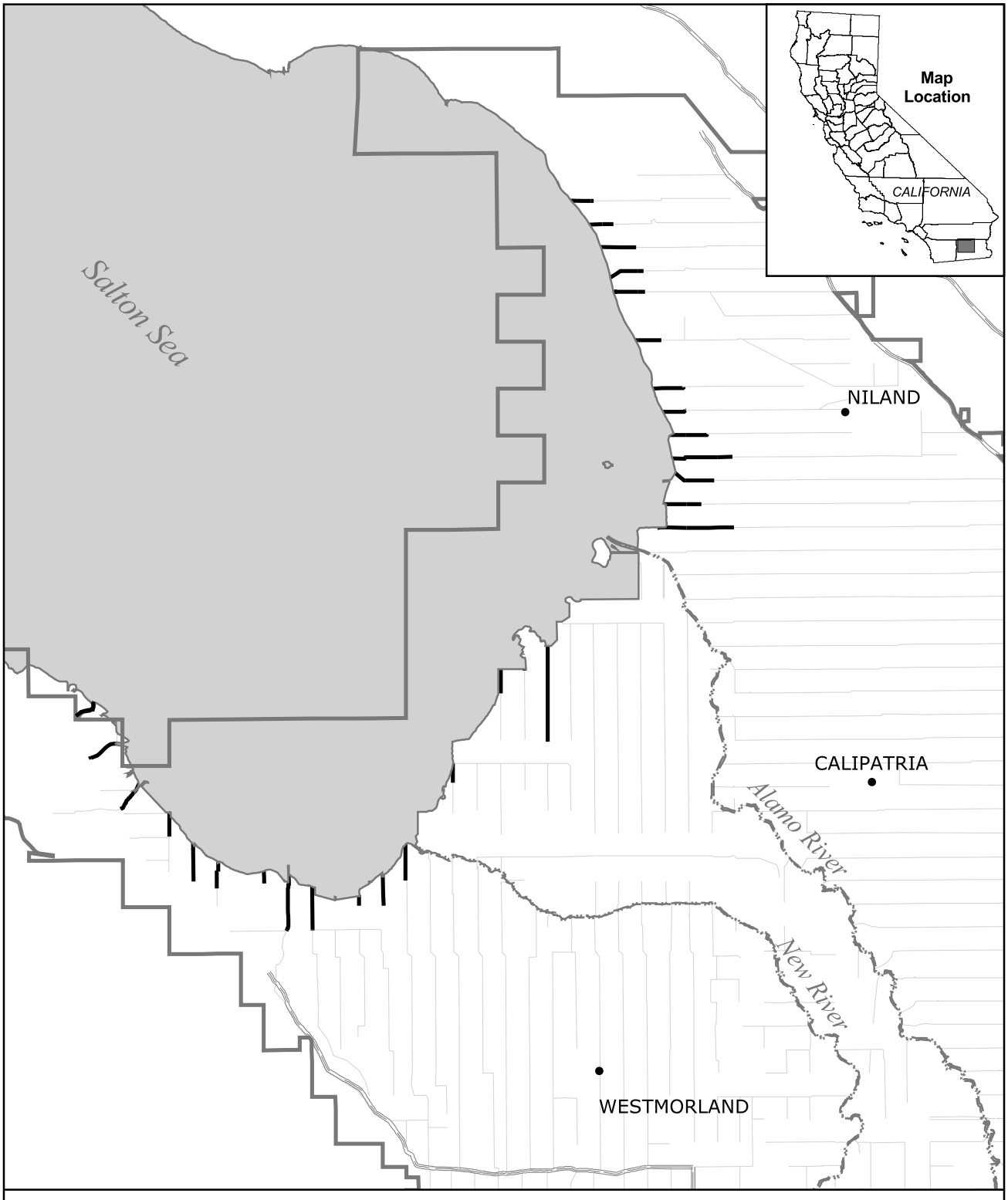



**Figure 3.7-1**
**Drains Supporting Desert Pupfish**
**IID Water Conservation and Transfer Project Draft HCP**

that incorporate only on-farm conservation and system improvements are projected to increase the annual average concentration of selenium from 4.8 ppb up to 6.69 ppb.

The effects of elevated selenium concentrations on pupfish reproduction and survival have not been directly assessed, and the USFWS currently is funding a study to evaluate the effects of selenium on desert pupfish. Other future studies might also evaluate the potential effects of selenium on pupfish and identify important concentration thresholds. This measure is intended to avoid or minimize the potential for increased selenium concentrations in the drains induced by water conservation to result in the incidental take of desert pupfish.

IID will monitor selenium concentrations in pupfish drains (see Section 4.6.2.1). Upon determination (as a result of the USFWS selenium study or other studies) of the effects of selenium on desert pupfish reproduction and survival, IID will work with the HCP IT to develop and implement practices to minimize the potential for incidental take of pupfish. IID has several options for reducing the selenium concentration in the drains. These practices could include splitting combined drain channels (drain/operational water) to improve water quality (Figure 3.7-2), providing limited biological treatment, including use of discharge from managed marsh mitigation habitat, and consolidating channels and blending flows. Fallowing also could be used to minimize potential increases in selenium resulting from water conservation measures.

***Pupfish–3.*** *IID will increase the amount of potential pupfish drain habitat (expressed as linear channel distance) over the term of the HCP. This will be accomplished as the Sea recedes by extending or modifying existing IID drains, creating additional drain channels, connecting pumped drains directly to the Sea, or by maintaining the suitability of naturally created drain channels. IID's financial obligation for creating and managing additional pupfish habitat will be based on the anticipated costs necessary to double the amount of pupfish habitat in the IID drains. The design, configuration, and management of these areas will be developed jointly by the HCP Implementation Team and IID, and will be developed in consideration of the specific physical characteristics of pupfish habitat (e.g., water depth and velocity, and channel width) and water quality (e.g., turbidity and selenium concentration). IID will continue to maintain and manage created pupfish habitats for the duration of the term of the ITPs, except where maintenance or management is in conflict with the objectives of the Salton Sea Restoration Project. IID will work with the HCP IT to implement this measure.*

IID's commitment to maintain (no net loss) and manage potential pupfish drain habitat in the Imperial Valley (Pupfish–1) is intended to help ensure the persistence of pupfish populations in the Imperial Valley over the term of the HCP. The requirements of Pupfish–3 focus on maintaining current habitat in those drains that discharge directly to the Salton Sea. Under various water conservation scenarios, including no action, the surface elevation of the Salton Sea is expected to decline. As the Sea recedes, land that is currently inundated will become exposed. IID's drainage system is dependent upon gravity flow to the sea, and as the sea recedes, additional channels will be created or developed to convey drain water to the sea. IID will take advantage of the opportunity to augment the availability of pupfish habitat as the Salton Sea recedes and drains are extended. As presently projected, reductions in water surface elevation at the Sea would expose areas over which drain water will flow to the sea. Under this measure, IID will work with the HCP IT to determine the best means for facilitating and managing these drain extensions. Options for managing these channel extensions could include allowing drain water flowing from the current discharge locations to create natural channels to

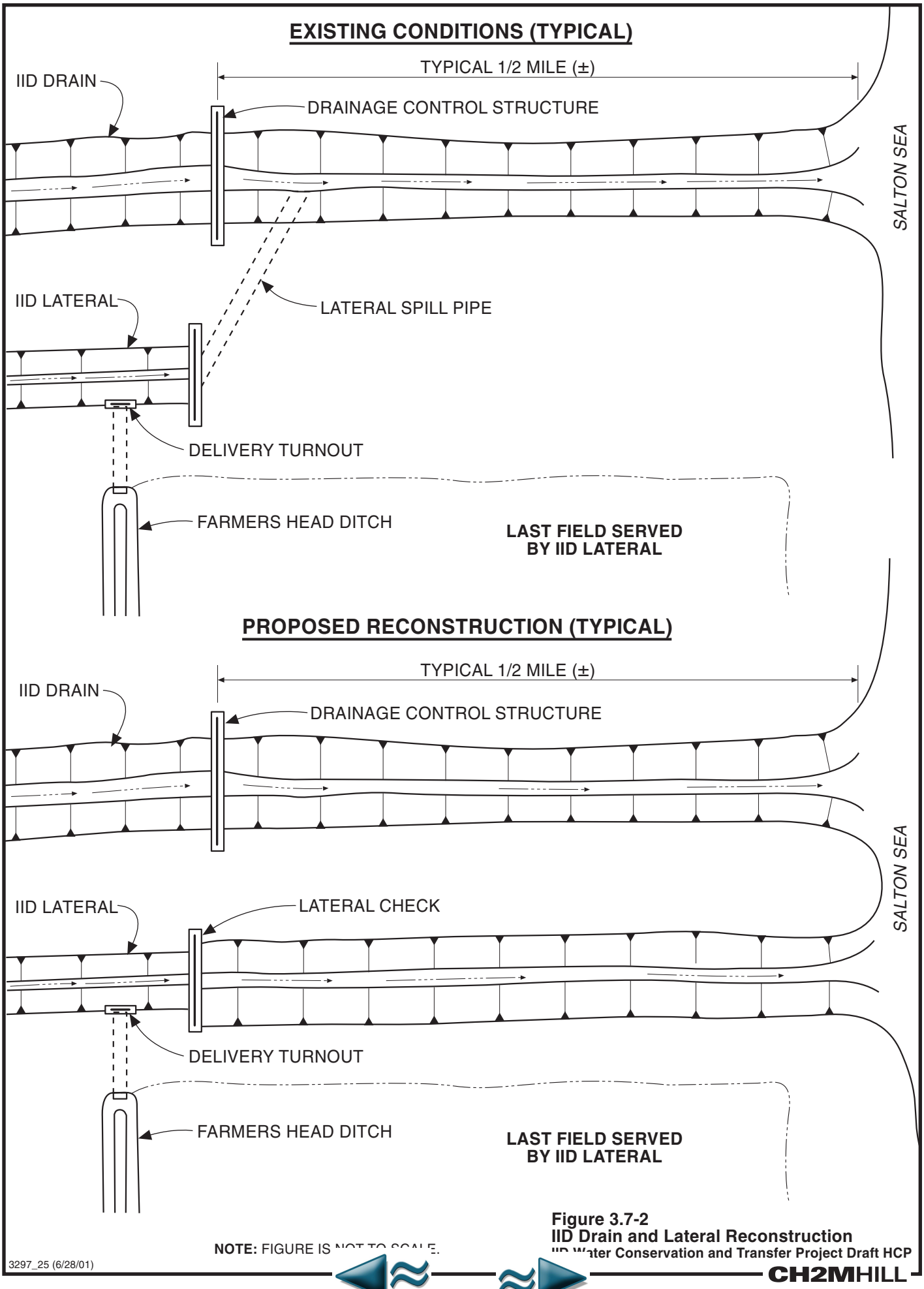



**Figure 3.7-2**
**IID Drain and Lateral Reconstruction**
**IID Water Conservation and Transfer Project Draft HCP**

**NOTE:** FIGURE IS NOT TO SCALE.

the sea or designing and actively creating channels. Channels allowed to extend naturally likely would meander over the exposed seabed, and should support conditions favorable for occupation by pupfish. However, some level of maintenance (e.g., vegetation control) likely would be required to retain the suitability of the habitat. Designed and constructed channels might be preferred or used in combination with unmanaged created channels.

In addition to the extension of drains that currently discharge to the Sea via gravity flow, a reduction of Sea elevation will allow IID to link directly to the Sea several large drains that are currently pumped (e.g., Vail Cut-Off and Pumice drains). These drains currently do not allow for movement of pupfish into the drain from the Sea. Connecting these drains directly to the Sea would provide pupfish with access to those pumped drains. Since gravity drains require less cleaning than pumped drains, more vegetative re-growth would be allowed to occur in these drains after they are opened to the Salton Sea. In addition, connection to the Sea would help prevent isolation of population segments.

IID's commitment to work with the HCP IT to actively increase pupfish habitat in areas exposed by a receding Sea will be limited by the total HCP budget. IID's financial obligation for creating and managing additional pupfish habitat will be based on the anticipated costs necessary to double the amount of pupfish habitat that currently exists in the IID drains. The HCP IT will have discretion over how the creation of additional pupfish habitat will be designed and managed. The HCP IT also will be allowed to allocate portions of the pupfish habitat budget to conducting studies to better define appropriate means for creating and managing pupfish habitat.

***Pupfish–4.*** *IID, in coordination with the HCP IT, will develop an appropriate protocol for monitoring pupfish presence in drains maintained by IID and in drain channels constructed under Pupfish–3. In developing an appropriate protocol, the HCP IT may confer with outside scientists and/or contract with researchers to specifically study alternative monitoring approaches. The HCP IT and IID will prepare a detailed protocol for monitoring pupfish presence within 5 years of issuance of the ITPs. If the HCP IT is not able to develop a protocol within 5 years, IID will use the prevailing method for surveying for the presence of desert pupfish.*

Several measures outlined in the pupfish strategy (Pupfish–1 and –3) assume that maintaining potential habitat will ensure continued use by pupfish. Although factors beyond IID's control could influence the persistence of pupfish in the drains (e.g., competition with exotic species), routine monitoring of pupfish presence will be necessary to confirm continued use and to develop information useful in adaptively adjusting the creation and management of habitat in the future. To date, reliable techniques for capturing or monitoring pupfish populations have not been developed. Capture using baited minnow traps has been successful in demonstrating presence; however, trapping has proven to be unreliable in documenting absence. In consideration of the limitations of existing techniques, the intent of this measures is to develop an appropriate protocol for monitoring pupfish presence in drains maintained by IID and in drain channels constructed under Pupfish–3. Under this measure, the HCP IT also will develop a detailed monitoring plan to document pupfish presence in the drains (see Section 4.6.2.1). If the HCP IT cannot develop a more appropriate survey protocol, IID will use the prevailing survey method for desert pupfish.

***Pupfish–5.*** *Within 3 years of completion of Pupfish–4, IID will initiate a study to evaluate the potential effect of routine drain maintenance on pupfish occupying the drains and to determine the efficacy of modifying maintenance practices to avoid or minimize potential take. The specific requirements of the studies will be developed by the HCP IT. In the event that the HCP IT can determine, based on the findings of the evaluation, that modification of the maintenance practices would minimize impacts to pupfish, IID will modify its maintenance practices, if practicable. Modifications in drain maintenance practices could include the timing of sediment and vegetation removal, the direction in which the drains are cleaned (i.e., upstream or downstream), and the manner in which sediment is removed from the channel (e.g., one side only).*

Desert pupfish use of habitat within the drains that discharge into the Salton Sea is influenced by flow, water quality, vegetation, and possibly the disturbance regime established by IID's drain maintenance activities. Pupfish populations also are influenced by interactions with exotic species. IID's ongoing maintenance activities and implementation of the water conservation program have the potential to influence these factors and to adversely affect the quality of pupfish habitat in the drains. While the continued long-term persistence of pupfish in IID's drains suggests that IID's drain maintenance practices (see Chapter 1 description of covered activities) are compatible with pupfish, it is possible that modification of these practices could reduce the potential for maintenance activities to take pupfish. Under this measure, IID will initiate a program to examine the effects of current drain maintenance practices on pupfish and adjust its practices based on the results of the study and the recommendations of the HCP IT. Potential modifications in drain maintenance practices could include the timing of sediment and vegetation removal, the direction in which the drains are cleaned (i.e., upstream or downstream), and the manner in which sediment is removed from the channel (e.g., one side only).

***Pupfish–6.*** *For construction activities (i.e., in-channel modifications) that directly affect pupfish drains, IID will gradually dewater the affected drain segment in a manner that will encourage the downstream movement of pupfish out of the affected area before construction. IID will ensure that a person qualified to capture and handle pupfish and that meets the approval of the USFWS and CDFG will be present during the dewatering process to salvage and transport any pupfish stranded in the affected portion of the drain. Prior to conducting construction activities that could result in the stranding of pupfish, IID will work with the HCP IT to develop guidelines for relocating fish. Salvaged fish will be transported to a safe location downstream of the construction site or to a location determined by the HCP Implementation Team.*

Over the term of the HCP, IID anticipates that various construction activities (e.g., reservoir construction, wetland project construction, and mitigation habitat creation) might be located in areas adjacent to drains that support desert pupfish. Although it is likely that IID will have sufficient flexibility in the siting of these construction projects to avoid impacts to desert pupfish in most situations, it is reasonable to assume that it may become necessary for IID to engage in construction activities that could affect pupfish during the term of the HCP. This measure provides a process to help ensure that potential take of desert pupfish associated with these activities is minimized. Construction activities that require the dewatering or removal of drain sections have the potential to strand pupfish if access to downstream habitat is blocked or if pupfish are not given adequate time to move out of the affected site. To avoid this potential, IID will dewater the affected portion of the drain channel in a manner that allows for the downstream movement of fish out of the construction site. IID will have a person

qualified to capture and handle pupfish at the construction site during the dewatering of the drain to salvage any pupfish that do not move downstream. Salvaged pupfish will be transported and released immediately downstream of the construction site or to an alternative location specified by the HCP Implementation Team.

#### 3.7.2.1 Effects on Desert Pupfish

Implementation of the desert pupfish conservation strategy would provide an overall benefit to desert pupfish occupying drains in the HCP area. Under the conservation strategy, the amount of habitat relative to current conditions would be maintained (Pupfish–1) or increased (Pupfish–3), and the potential for adverse effects on desert pupfish resulting from the water conservation project would be avoided or minimized (Pupfish–2). The results of the studies that will be carried out under measure Pupfish–5 are expected to further benefit pupfish by providing the information necessary for IID to manage its drainage system in a manner that reduces the potential for incidental take and that encourages the continued persistence of pupfish in the Imperial Valley. Moreover, the possible reconfiguration of existing drains and creation of additional habitat is expected to significantly augment existing pupfish habitat in the Imperial Valley.

### 3.7.3 Razorback Sucker

Razorback suckers are known to occur in the All American and East Highline Canal systems. This species has also been found in an IID reservoir near Niland. The population in Imperial County is believed to be composed of old members of a dwindling, nonreproductive, remnant stock (Tyus 1991; Minckley et al. 1991). No recruitment of wild-spawned fish occurs.

Razorback suckers in the HCP area are isolated from the main razorback sucker population in the Colorado River and its tributaries. Because they are isolated from the main population and are not known to be reproducing, razorback suckers in the HCP area are not contributing to the overall razorback sucker population. As a result, loss of these individuals would have no effect on the razorback sucker population. Although take of individual razorback suckers in the IID canals system would not impact the species' population, IID will implement measures to minimize mortality of suckers as a result of canal dewatering.

***Razorback Suckers–1.*** *IID will ensure that a person qualified to capture and handle razorback suckers and that meets the approval of the USFWS and CDFG will be present during the dewatering of main canals (All-American, Westside Main, East Highline, or Central Main) or reservoirs on these four canals. Any razorback suckers stranded in the affected portion of the canal will be salvaged. Salvaged fish will be transported to the Colorado River. The HCP IT will develop a procedure for salvaging and returning fish to the Colorado River consistent with other procedures for handling razorback suckers.*

This measure was derived from measures for razorback suckers required by the USFWS in the Biological Opinion for the AAC Lining Project (USFWS 1996). By salvaging any razorback suckers found in the main canals and associated reservoirs when they are dewatered and returning these fish to the LCR, loss of these could be avoided. If left in the canal system when the canal is dewatered, any suckers in the canal would certainly be lost. Under this measure, fish will be salvaged and returned to the LCR where they could contribute to the overall population.

# 3.8 Agricultural Field Habitat Conservation Strategy

## 3.8.1 Amount and Quality of Habitat in the HCP Area

Irrigated agricultural land is the dominant land cover type in the Imperial Valley, and comprises most of the HCP area. Foraging is the predominant use of agricultural fields by covered species although they are also used as resting habitats (Shuford et al. 2000). IID's Service Area encompasses approximately 500,000 acres of irrigated agriculture. The amount and types of crops grown in the HCP area varies from year-to-year and different species use different crop types. Despite this variability, a few crop types appear to be preferred by the covered species. These crops are:

- Alfalfa
- Sudan grass
- Bermuda grass
- Wheat

Historically, alfalfa has been a predominant crop in the Imperial Valley, comprising about 27 to 43 percent of the agricultural acreage (Figure 3.8-1). In contrast, the amount of Sudan grass and Bermuda grass only recently has become a significant crop in the HCP area (Figures 3.8-1 and 3.8-2). In the 1970s both of these crops comprised less than 1 percent of the agricultural acreage in the Imperial Valley, but in recent years, both have exceeded 10 percent of the agricultural acreage in the valley.

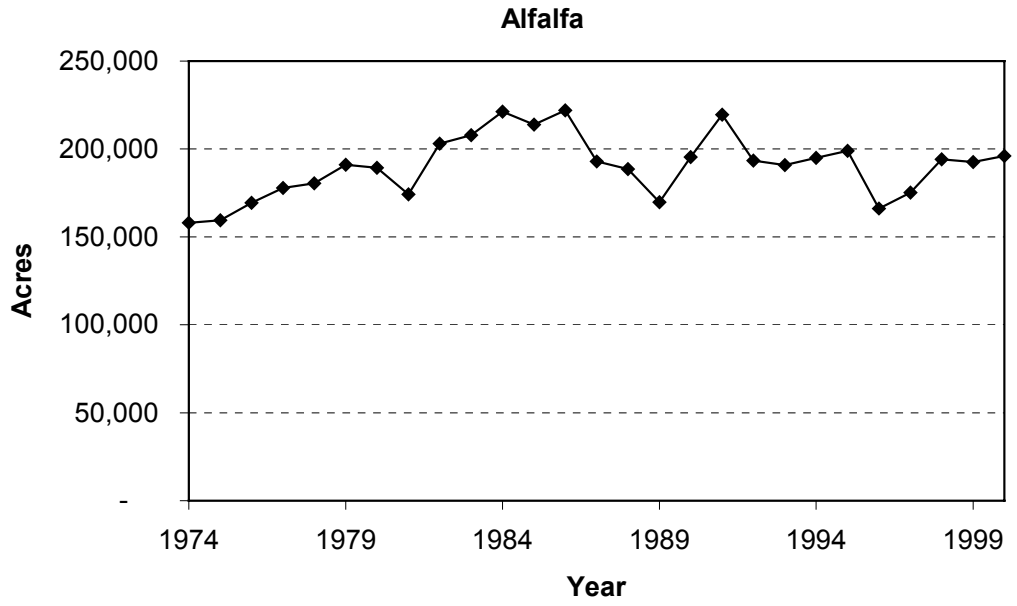
## 3.8.2 Effects of the Covered Activities

The acreage fallowed and resultant effects on covered species will be revised based on the revised salton sea conservation strategy.

Over the term of the permit, covered species using agricultural fields in the Imperial Valley could be directly affected by some of the covered activities. Many of the activities covered by the HCP consist of activities conducted by IID to maintain and operate its conveyance and drainage systems. These O&M activities are limited to IID's rights-of-way that are adjacent to but not within agricultural fields. As such they have very limited potential to impact a covered species. The primary activities covered by the HCP with a potential to affect species using agricultural fields are:

- Conversion of land owned by IID that is currently in agricultural production to other covered activities (e.g., creation of managed marsh habitat)
- Various construction activities that could occur in or adjacent to agricultural fields
- Water conservation measures implemented on farms, including fallowing

In addition to these activities, depending on the Salton Sea approach followed, changes in the amount of agricultural field habitat could result from implementation of the HCP as well. Table 3.8-1 summarizes the potential effects of the covered activities on species associated with agricultural field habitat. Additional discussion of those activities with the potential to affect covered species using agricultural fields is provided following the table.



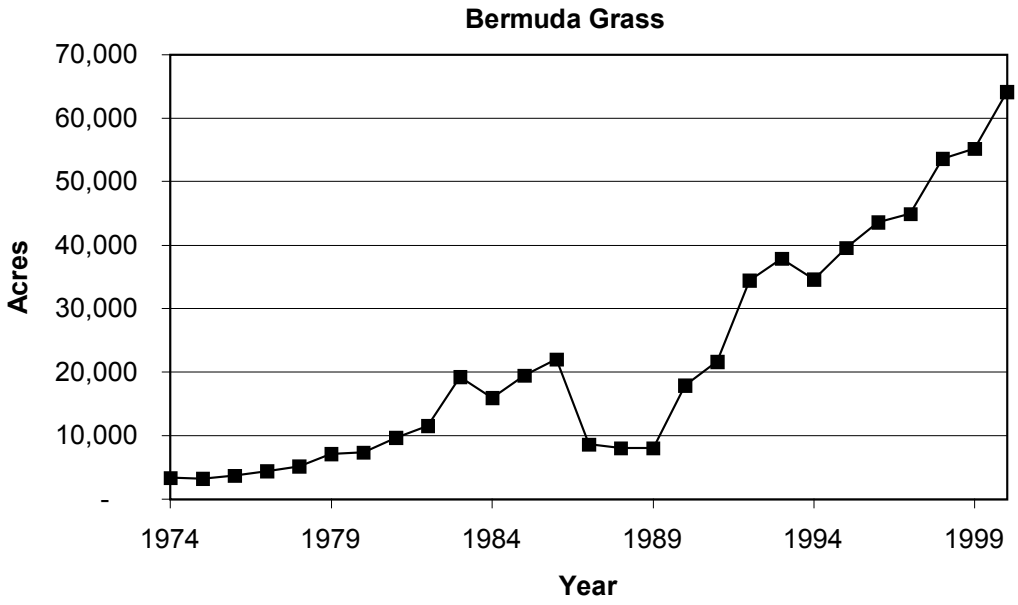




**FIGURE 3.8-1**
Historic Acreages of Alfalfa and Bermuda Grass in the Imperial Valley.

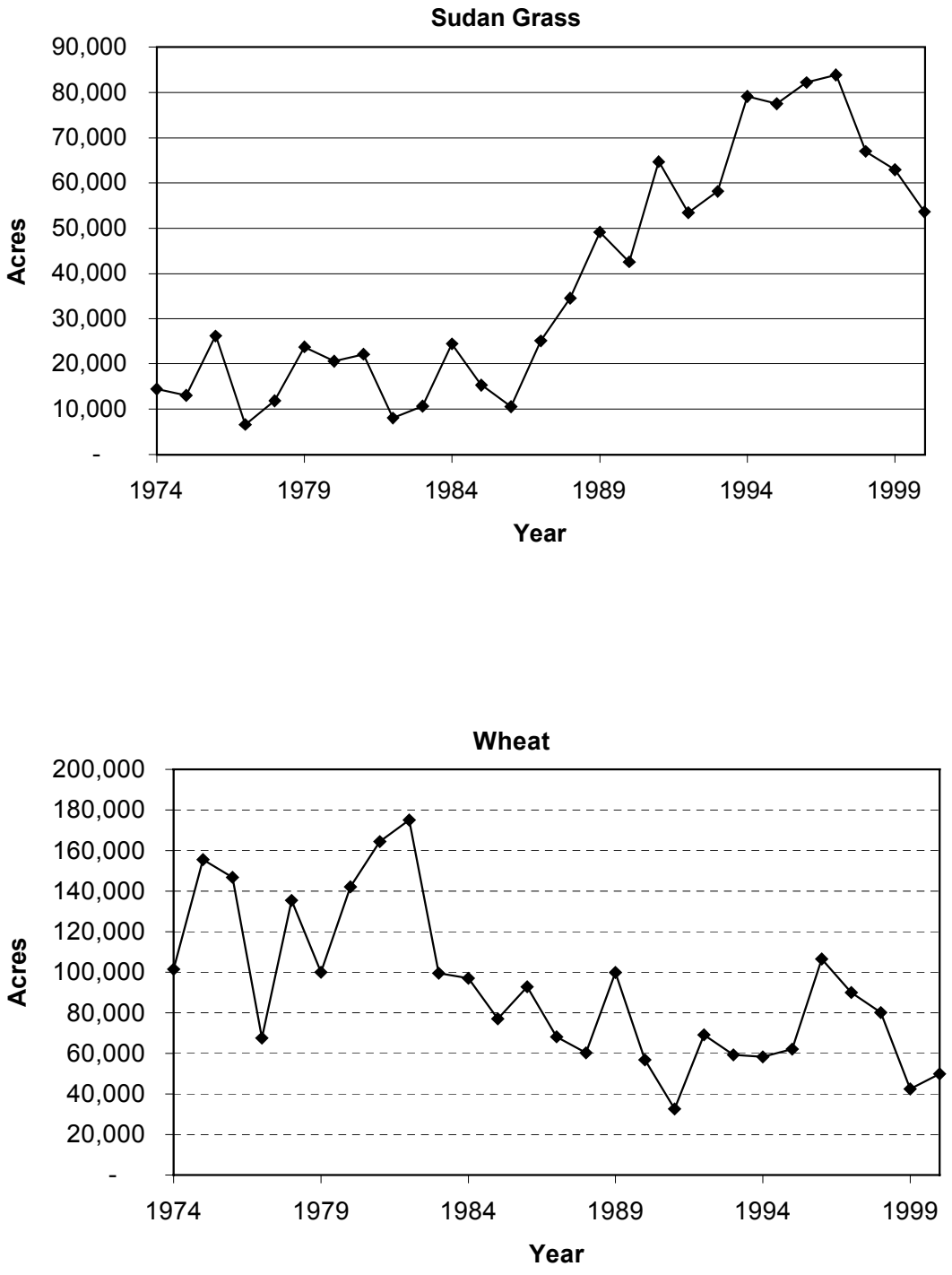



**FIGURE 3.8-2**
Historic Acreages of Sudan Grass and Wheat in the Imperial Valley

**TABLE 3.8-1**
Potential Effects of Covered Activities on Covered Species Associated With Agricultural Field Habitat

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| **Water Use and Conservation** | |
| Combined effects of on-farm and system-based water conservation | Combined effects relate to changes in the water quantity and quality in the drains, changes in salinity in the Salton Sea and changes in the water surface elevation at the Salton Sea. Agricultural fields would not be affected by these changes. |
| Installation of on-farm water conservation features | Installation and operation of on-farm water conservation features could affect covered species using agricultural field habitat through disturbance as features are installed, and reduction in the amount of agricultural field habitat. Installation of tailwater return systems could result in up to 12,500 acres of agricultural land being converted to tailwater ponds. No effects to covered species from long-term changes in irrigation techniques are expected. |
| Fallowing | If used for water conservation, fallowing would reduce the amount of land in agricultural production by up to 50,000 acres and could change the availability of foraging habitat for covered species. |
| **Installation of System-Based Water Conservation Features** | |
| Canal lining and piping | Because canal lining activities would be performed within IID's right-of-way, no changes in the amount of agricultural field habitat would occur. Disturbance to most covered species using field adjacent to canals during the lining process would not be expected because lining would be conducted when the adjacent fields are not being irrigated. Thus, covered species would not be expected to be in areas adjacent to the construction. |
| Construction of new canals | IID anticipates constructing about 0.25 mile of canal each year. Because new canals would likely cross agricultural fields, about 2 acres of agricultural field habitat could be removed each year. |
| Lateral interceptors | IID could install 16 lateral interceptor systems. The canal and reservoirs comprising these systems predominantly would be located in agricultural fields. About 1,480 acres of agricultural field habitat could be lost if all of the systems were constructed. |
| Reservoirs | IID currently does not have any reservoirs in design, but anticipates constructing up to 100 reservoirs during the 75-year permit term. These reservoirs would be 1 to 10 acres in size, with a capacity ranging from about 5 to 30 acre-feet (AF). It is anticipated that most of these reservoirs would be located in agricultural fields. Up to 1,000 acres of agricultural field habitat could be lost from reservoir construction.<br><br>In addition to reservoirs constructed and operated by IID, farmers could construct small regulating reservoirs to facilitate the conservation of water. These 1- to 2-acre reservoirs would be constructed to better regulate irrigation water applied to fields and to settle suspended solids prior to introduction into drip irrigation systems. IID anticipates that these reservoirs could be used on up to 50 percent of the agricultural land in its service area. A single reservoir services about 80 acres of land. About 3,000 of these reservoirs could be constructed, potentially resulting in the loss of about 6,000 acres of agricultural land. |
| Seepage recovery systems | Seepage recovery systems would be installed adjacent to but not within agricultural fields. Thus, no change in the amount of agricultural field habitat would occur. There would be a minor potential for disturbance of covered species using adjacent agricultural fields during construction activities. |

**TABLE 3.8-1**
Potential Effects of Covered Activities on Covered Species Associated With Agricultural Field Habitat

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| **Operation and Maintenance** | |
| Conveyance system operation | Conveyance system operation is limited to moving water through the canals to meet maintenance and customer needs. Other than the filling, draining and moving water through the canals, no physical effects are encompassed by conveyance system operation. |
| **Drainage System Operation** | |
| Rerouting or constructing new drains | IID reroutes or constructs about 2 miles of drains every 10 years. With a standard drain right-of-way, of about 80 feet, about 19 acres of agricultural field habitat could be impacted every 10 years. |
| Piping drains | Over the 75-year term IID anticipates that about 50 miles of open drains would be pipelined. If the land formerly occupied by the open drain is farmed, an additional 485 acres of agricultural habitat could be supported as drains are piped. |
| Inspection activities | Potential effects of inspection activities would be limited to a minor potential for disturbance of covered species if they occur in the vicinity of structures at the time of inspection. |
| Canal lining maintenance<br>Right-of-way maintenance<br>Embankment maintenance<br>Erosion maintenance<br>Seepage maintenance<br>Structure maintenance<br>Pipeline maintenance<br>Reservoir maintenance<br>Sediment removal<br>Vegetation control | These activities are limited to IID's rights-of-way along the canals and drains and around reservoirs. Because they do not extend into adjacent agricultural fields, they would not result in changes in the amount of agricultural field habitat. Effects are limited to a minor potential to disturb covered species using agricultural fields adjacent to the drain, canal or reservoir where the maintenance is being conducted. |
| New and Alamo river maintenance | River maintenance activities occur in and immediately adjacent to the river channels. Because river maintenance activities do not extend into adjacent agricultural fields, they would not result in changes in the amount of agricultural field habitat. No disturbance to agricultural field habitat species would be expected. |
| Salton Sea dike maintenance | Salton Sea dike maintenance activities consist of replacing riprap, grooming embankments and repairing damaged sections of the dikes. Because the maintenance activities would occur on the sea side of the dikes, no change in habitat would occur with these activities and no disturbance of covered species would be expected. |
| Gravel and rock quarrying | Quarries are not located in or immediately adjacent to agricultural fields. Therefore, no impacts to covered species using agricultural fields would occur from quarrying. |
| Fish hatchery operation and maintenance | The fish hatchery is a developed facility and does not contain habitat for covered species associated with agricultural fields. |
| Recreational facilities | New recreational facilities would be developed within IID's rights-of-way and therefore would not affect agricultural field habitat. Effects to covered species are limited to a minor potential to disturb covered species using agricultural fields adjacent to the rights-of-way. The HCP does not cover take of covered species by recreationists. |

**TABLE 3.8-1**
Potential Effects of Covered Activities on Covered Species Associated With Agricultural Field Habitat

| Activity | Potential Effects (Positive and Negative) |
|---|---|
| HCP/EIS/EIR mitigation | The Drain Habitat Conservation Strategy includes construction of managed marsh. If located on agricultural lands, up to 652 acres of agricultural fields would be converted to managed marsh.<br><br>The Salton Sea Conservation Strategy includes supplying water to the Sea to maintain salinity below 60 ppt until 2030. Fallowing could be used to generate this water which would reduce the amount of agricultural field habitat. The acreage of land fallowed would depend on the method used to conserve water for transfer as described below. |
| Land use changes | IID leases out about 1,169 acres of land for agricultural production. IID could convert this land to another use (e.g., managed marsh) resulting in a reduction in the amount of agricultural land. |

The HCP covers conversion of land owned by IID from agricultural production to other covered uses (e.g., creation of managed marsh habitat). It does not cover other landowners that convert their lands to nonagricultural uses. Fallowing is considered an agricultural land use and fallowing by landowners in the IID service area is covered by this HCP. IID owns about 6,600 acres of land in the irrigated portion of the Imperial Valley and about 6,100 acres of land adjacent to the Salton Sea. About 1,167 acres of land leased from IID is in agricultural production (see Table 1.7-5). This land represents about 0.2 percent of the irrigated lands in the HCP area. Thus, even if all of IID land in agricultural production was converted to another use, agricultural field habitat would remain abundant in the HCP area.

System improvements that could eliminate some agricultural field habitat are construction of new canals, installation of lateral interceptors, and construction of new reservoirs. These activities could remove about 8,630 acres of agricultural field habitat over the term of the permit. Relative to the entire irrigated area of Imperial Valley that covers about 500,000 acres, this potential loss constitutes about 1.7 percent of the agricultural land. Because construction would not occur in agricultural fields under active production, the potential for disturbance of covered species using this habitat would be minor.

Farmers in the IID service area could implement a variety of measures to conserve water, including the following:

- Installing tailwater return systems
- Dividing fields into level basins
- Installing drip irrigation systems
- Shortening furrows/border strips
- Narrowing border strips
- Implementing cutback irrigation
- Laser leveling fields
- Changing field slopes to improve water distribution uniformity
- Employing cascading tailwater systems

Installation of tailwater return systems could result in a small amount of land being taken out of production to accommodate a tailwater pond. Tailwater ponds typically have about a 3-to-4 acre-feet (AF) capacity and cover 1 to 2 acres. Assuming an average farm size of 80 acres, a 2-acre tailwater return pond could eliminate about 2.5 percent of the area from agricultural production. If all farms installed tailwater systems, a 2.5 percent reduction in farmed area throughout the Imperial Valley would amount to about 12,500 acres. Farmers typically locate tailwater return ponds in the least productive portions of their fields particularly areas that are farmed irregularly such that the actual loss in agricultural field habitat likely would be less than 12,500 acres in the extreme case that all farms installed tailwater return systems. Tailwater return systems are installed when no crops are being produced, typically during the summer. Because they would be installed when no crops were being grown on the field, the potential for disturbance to covered species would be limited.

Operation of a tailwater return system requires pumping water from the tailwater pond back up to the field head. In the Imperial Valley, farmers usually use diesel-powered pumps because they are less expensive to operate. However, some farmers could use electric pumps, requiring IID to erect additional power lines to provide power to the pumps. Although the additional power lines would be short, up to 0.5 mile, and distributed throughout the valley, they could result in take, if covered bird species fly into the power lines.

Installing drip irrigation systems would require a minor amount of temporary ground disturbance, resulting in a minor potential for disturbance of covered species. Installations of drip systems would occur between crops; therefore, no temporary or permanent changes in the amount of agricultural field habitat would occur.

The remaining water conservation techniques require reconstruction/recontouring of an agricultural field. Covered species using agricultural field habitat could be disturbed during the reconstruction/recontouring. However, because reconstruction/recontouring would be conducted when no crops are being grown on the field, the potential for disturbance to covered species is limited. No change in the amount of agricultural field habitat would occur as a result of reconstruction/recontouring of agricultural fields to achieve water conservation.

While farmers would implement various water conservation practices, these practices are not expected to change irrigation practices in a manner that would reduce habitat suitability for covered species. A given crop consumes a certain amount of water. This consumptive use would not change with water conservation and a given crop would need to be irrigated at the same frequency as under existing irrigation practices. The water conservation techniques would reduce the amount of tailwater (i.e., surface water that runs off the field), not the amount of water consumed by the crops. Also, with the exception of drip irrigation systems, the water conservation techniques improve the efficiency of a surface irrigation practice, rather than change how the crop is irrigated. For example, tailwater return systems collect and store water from a flood irrigated field for use in subsequent flood irrigations. The improved efficiencies would be manifested as a reduction in the amount of water leaving the field as tailwater.

In addition to the water conservation measures discussed above, fallowing could be used to conserve water for transfer and in complying with the Inadvertent Overrun Policy. Fallowing could reduce the acreage of irrigated agriculture available in the HCP area at any one time. If only fallowing was used to generate 300 KAF of conserved water, about 50,000 acres of land would be needed. To comply with the IOP, an average of 9,800 acres of land would need to be fallowed. Combined, these acreages represents about 12 percent of the irrigated area within the IID Service Area. Even with this reduction, agricultural field habitat would remain abundant in the IID Service Area, consisting of about 440,000 acres remaining in agricultural production.

It is anticipated that farmers will participate in the water conservation program for variable periods of time. Some farmers may enroll one or two fields for only one year while others may enter into longer term agreements. Regardless of the duration and method of water conservation, this HCP covers removal and cessation of water conservation practices. If fallowing is used to conserve water for transfer or to comply with the IOP, agricultural fields could be fallowed and returned to production several times over the term of the permit. Because most of covered species associated with agricultural fields in the HCP area are attracted fields in active production, the acreage of agricultural field habitat could fluctuate between the existing level of about 500,000 acres and 440,000 acres with use of fallowing to achieve all water conservation.

Some farmers that install tailwater return systems could convert tailwater ponds back to agricultural production after their conservation agreements with IID ended. In the Imperial Valley, tailwater ponds are maintained free of vegetation (see Figure 1.7-2b). While covered species may be attracted to the ponds to drink or bathe, given the lack of vegetation no covered species would be expected to nest or shelter at the ponds. Conversion of 12,500 acres of tailwater pond back to agricultural production would not be expected to impact covered species.

The Salton Sea Conservation Strategy entails generating mitigation water such the salinity of the Salton Sea would remain below 60 ppt until 2030. The amount of land that would need to be fallowed would depend on how water for transfer was conserved. If fallowing was used to generate all of the 300 KAFY of water for transfer, then about 25,000 acres of land would need to be fallowed for mitigation water. Under this scenario, a total of 75,000 acres of land would be fallowed. If on-farm and system-based measures were used to conserve 300 KAFY of water for transfer, then about 75,000 acres of land would be need to be fallowed for mitigation water. After 2030 when mitigation water would no longer be supplied to the Sea, fallowed land could be returned to agricultural production.

The acreages presented above of agricultural field habitat potentially affected under the water conservation and transfer programs represent worst-case estimates for each of the covered activities and are not additive. For example, farms that fallowed land to achieve water conservation would not install tailwater return systems. The ultimate amount of agricultural land that could be taken out of production to implement the water conservation and transfer programs is uncertain because it would be influenced by the mix of water conservation measures that are implemented. Nonetheless, any change in the amount of agricultural land would be within the ranges presented above.

## 3.8.3 Approach and Biological Goals

The biological goal of the agricultural field conservation strategy is to maintain agriculture as the primary economic enterprise in IID's Service Area to continue to provide foraging habitat for covered species associated with agricultural field habitat. This goal is to be achieved by implementing the water conservation and transfer programs for the IID/SDCWA Water Transfer Agreement and the QSA, and this HCP. Species that exploit agricultural habitats would continue to be supported with implementation of water conservation and transfer programs and HCP because successful implementation of these programs would encourage continued agricultural production.

## 3.8.4 Agricultural Field Habitat Strategy

Agriculture is the primary economic enterprise within IID's service area. Agriculture in the Imperial Valley is dependent upon a secure right to divert and use Colorado River water for irrigation purposes and an efficient system of drainage. IID holds very senior water rights under priorities 3, 6, and 7 of the Seven Party Agreement, which allocates California's share of Colorado River water among California entitlement holders. For years, however, other California water agencies, including the QSA parties, have challenged the amount and use of Colorado River water diverted by IID under its senior water rights. IID also has been required to develop a conservation program, and specifically to consider water transfers, as a result of SWRCB regulatory proceedings in the 1980s, as set forth in Decision 1600 (1984) and Order 88-20 (1988).

A couple of key objectives of the IID/SDCWA Transfer Agreement include: (1) implementation of a water conservation and transfer program without impairing IID's historic senior-priority water rights, in a manner consistent with state and federal law, and (2) providing a means of financing conservation measures, including environmental and other implementation costs. Thus, the water transfer program is intended to protect and preserve IID's water rights and the feasibility and economic viability of agriculture production within IID's service area. In addition, the QSA will settle, by consensual agreement, longstanding disputes among the QSA parties regarding the priority and use of Colorado River water by IID, and it will confirm IID's right to implement the water transfers specified in the QSA. Thus, the QSA will enhance the certainty and reliability of Colorado River water supplies available to IID and will assist IID in meeting demands for water for agricultural use, thus facilitating continued agricultural production.

As explained in Chapter 1, the purpose and need for the HCP stems from IID's requirement for long-term regulatory certainty in committing to the IID/SDCWA Transfer Agreement and QSA. Long-term no-surprises assurances regarding FESA compliance measures and costs are needed by IID to commit to the long-term investment obligations of the IID/SDCWA Transfer Agreement and QSA. Thus, incidental take authorization and unlisted species assurances is integral to implementing the water transfer programs, which in turn are critical to ensuring that agriculture will continue to be the primary land use in the Imperial Valley.

With a few exceptions, the covered species that use agricultural fields in the Imperial Valley would probably not occur in the Imperial Valley in the absence of agriculture. Before the cultivation of the Imperial Valley, desert habitat predominated and supported wildlife

species associated with this habitat. With agricultural production, the Imperial Valley attracted wildlife capable of exploiting this new resource and with a tolerance for regular human activity. The continued use of the Imperial Valley by these species depends primarily upon the perpetuation of agricultural production. The regulatory certainty provided by the incidental take authorization and assurances obtained with implementation of the HCP, combined with implementation of the water transfer programs would increase the likelihood that agricultural production will remain the predominant land use in the HCP area.

Although the primary concern for covered species associated with agricultural field habitat is the persistence of agriculture in the Imperial Valley, a potential for covered bird species to be killed or injured by powerlines associated with pumps for tailwater return systems was identified. Under the HCP, IID will implement the following measure to minimize this potential impact.

***Agriculture–1.*** *If IID builds additional power lines to provide power to pumps to run tailwater return systems, IID will install markers (e.g., flagging, balls, discs) in accordance with industry standards for reducing bird strikes on the new power lines to alert birds to the presence of the power lines.*

In implementing the water conservation and transfer program, IID may fallow land it owns to conserve water. Implementation of the following measure is anticipated to enhance the habitat value of fallowed lands as foraging habitat for covered species. Cover crops would provide food resources and cover for small mammals and insects while ridge tilling would make soil invertebrates more accessible to insectivores.

***Agriculture–2.*** *IID will plant cover crops on or ridge till all lands that it currently owns and fallows to conserve water in order to maintain foraging opportunities for covered species. Cover crops will be planted during the first year the land is fallowed and will be replanted at a frequency necessary to maintain a layer of plant material on the soil. IID will work with the HCP IT to select appropriate cover crop types.*

## 3.8.5 Effects on Habitat

### 3.8.5.1 Direct Effects of the Covered Activities

Implementation of the water conservation and transfer programs could result in a reduction in the amount of land in agricultural production at any one time. The amount of agricultural land affected would depend on the mix of water conservation techniques. To conserve water for transfer, fallowing could result in up to 50,000 acres of agricultural land being taken out of active production for one or more seasons. Other conservation techniques would result in a substantially smaller reduction in the acreage of agricultural land. With the exception of the HCP measures for the Salton Sea, other covered activities would have only minor effects on the amount of agricultural land. As described previously, depending on the approach selected for the Salton Sea, up to 75,000 acres of agricultural land could be taken out of production for fallowing for mitigation water or for 5,000 acres of ponds.

### 3.8.5.2 Changes in Cropping Patterns

The crops grown in the Imperial Valley are based on the decisions of individual farmers. Current and anticipated market prices are an important consideration for the farmers in deciding which crops to grow. As a result, the types and amount of crops grown fluctuate from year-to-year as is illustrated by the types and acreages of crops grown in the IID from 1974 to 2000 (Appendix E).

Historically, IID's water deliveries to farmers have ranged from about 2.4 MAFY to 3.4 MAFY, a range of 1 MAFY. Under the water conservation and transfer programs, up to 300 KAFY would be conserved. This level of water conservation is within the range of historic variability in IID's annual deliveries to farmers. Because of weather (hot), soil types (high clay content) and irrigation water quality (salinity), certain crops grow better than others in this environment and as a result, it is expected that the same crop mix will continue to be grown into the future. Thus, cropping patterns in the future would be expected to be within the range of historic variability.

## 3.8.6 Effects on Covered Species

Covered species potentially using agricultural field habitats in the HCP area include resident breeding species, migratory breeding species, short-term residents during winter or migration, and transient species that occur in the HCP area irregularly during migration or other wanderings. The effects of implementing the HCP on covered species associated with agricultural field habitat are evaluated below.

### 3.8.6.1 Mountain Plover

Mountain plover is a common winter visitor to the Salton Sea Basin. The Imperial Valley has one of the mountain plover's largest wintering populations in the Pacific Flyway. During February 1999 surveys, 2,486 individuals were counted in the valley. This number represents about half of the California population and about one quarter of the North American population.

Installation of water conservation measures in agricultural fields have a minor potential to affect mountain plovers. On-farm conservation measures would be installed when crops were not being grown, primarily in the summer. Mountain plovers only occur in the HCP area during the winter and therefore, would not be in the area when this work was being conducted. Construction in agricultural fields required for other covered activities such as creation of managed marsh habitat or system-based conservation measures could occur during the winter when plovers are in the HCP area. These activities could flush birds if the construction occurred in areas used by mountain plovers for foraging which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed they are subject to predation. Given the large amount of agricultural habitat available (about 500,000 acres), a relatively small number of plovers (about 2,500 birds), and limited amount of disturbance spread out over the term of the permit (e.g., disturbance of up to 652 acres to create the managed marsh, construction on 8,630 acres for system improvements), the likelihood of these activities occurring coincident with mountain plovers is low. As such, the potential for and extent of take would be minimal.

In the Imperial Valley, mountain plovers are strongly associated with agricultural fields. Recent studies have found mountain plovers to most frequently use grazed alfalfa, and burned Bermuda grass fields. They have also been reported to forage in plowed fields and sprouting grain fields during the winter. Depending on the water conservation measures and Salton Sea approach implemented the amount of agricultural land in production could be reduced by about 15 percent. Potentially, a few individual plovers could be taken as a result of reduced foraging habitat in the HCP area. However, as explained below, no adverse population-level effects would be expected.

Plover abundance in the Imperial Valley does not appear to be related to the availability of preferred crop types. Bermuda grass currently is one of the most commonly used crop types by plovers. The acreage of Bermuda grass was very low in the 1970s but is currently abundant (Figure 3.8-1). During this same period, the relative abundance of mountain plovers showed no discernable trend (Figure 3.8-3). These data suggest that foraging habitat availability is not limiting and that a potential reduction in agricultural acreage typically would not impact the population of mountain plovers that winters in the HCP area.

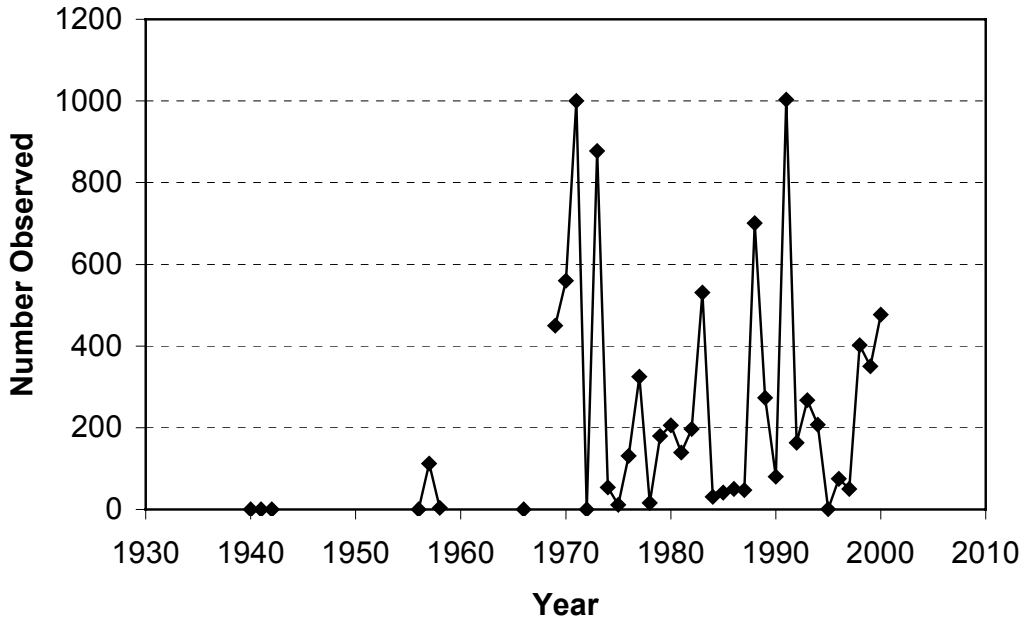



**FIGURE 3.8-3**
Christmas Bird Count Results for the Salton Sea (South End) for Mountain Plovers

Plovers also show an affinity for grazed alfalfa. Sheep graze alfalfa in the Imperial Valley from October through March, approximately the period when mountain plovers are in the valley. As with crops, the number of sheep grazed in the valley (Figure 3.8-4) and hence the acreage of alfalfa grazed varies from year to year. Like Bermuda grass, mountain plover relative abundance appears unrelated to the level of sheep grazing, and hence the acreage of grazed alfalfa. Further, the amount of grazed alfalfa is not expected to change as a result of the water conservation and transfer programs. The Imperial Valley provides important winter range for sheep. As long as there is a demand for winter pasture, sheep grazing will continue in the Imperial Valley. Implementation of the water conservation programs would not change the demand for winter range. Therefore, the current availability of grazed alfalfa would not change because of the water transfer project and no adverse effects to the mountain plover population would occur.

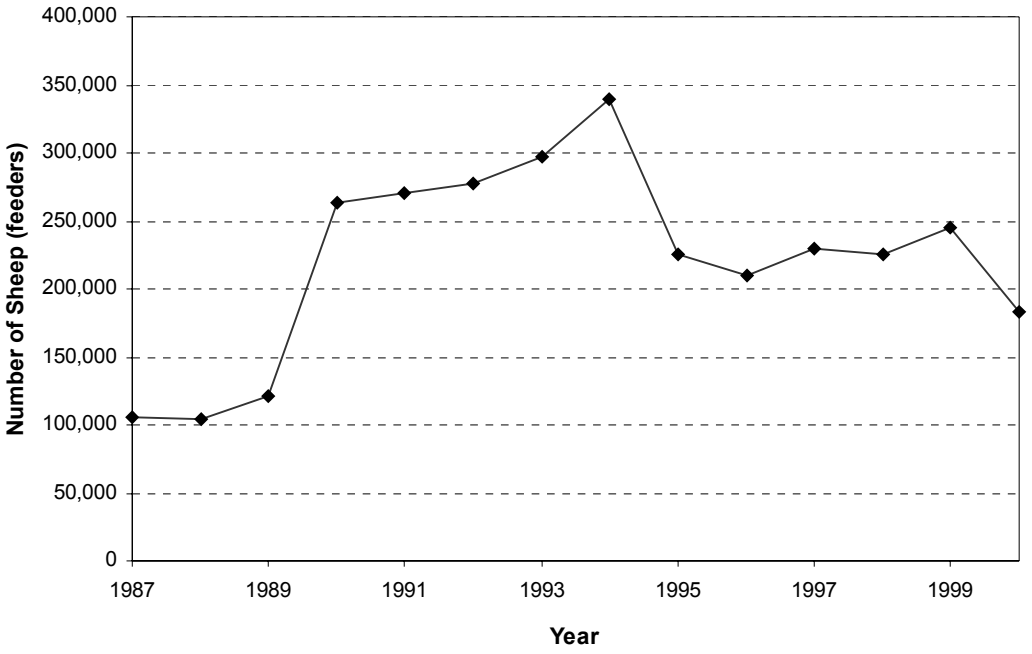



**FIGURE 3.8-4**
Number of Sheep Grazed in the Imperial Valley

Preliminary research also suggests that plovers avoid fields being irrigated with sprinklers; the reasons for this pattern are uncertain. Implementation of the water conservation and transfer programs would not change the level of use of sprinklers for irrigation in the Imperial Valley. Sprinkler systems are primarily used to germinate seed and for cooling of young crops planted in late summer; use of sprinklers for irrigation is limited. The need to use sprinklers for germination and cooling would continue with implementation of the water conservation and transfer programs. Use of sprinklers would not increase because it is not a favorable irrigation method in desert environments due to high evaporative losses.

The Imperial Valley appears to be an important overwintering area for mountain plovers, and this species' winter habitat requirements apparently are compatible with and provided

by agricultural fields. The greatest potential threat to wintering habitat for mountain plover would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley. In addition, IID would plant a cover crop or ridge till lands that it owns and fallows which would make insects accessible for mountain plover. By enhancing the probability that wintering habitat will continue to be supported in the HCP area and by implementing measures for fallowed lands to enhance insect availability, the HCP would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

#### 3.8.6.2 Swainson's Hawk

Swainson's hawks are occasional visitors to the Salton Sea area during their spring and fall migrations. They are not known to breed in the HCP area. For foraging, Swainson's hawks frequent agricultural fields. In other parts of its range, the Swainson's hawk frequents alfalfa fields and lightly grazed pasture. Similar types of agricultural fields likely are used in the Imperial Valley.

Installation of water conservation measures in agricultural fields would not be expected to affect Swainson's hawks. On-farm conservation measures would be installed when crops were not being grown, primarily in the summer. Swainson's hawks only occur in the HCP area during the spring and fall and therefore, would not be in the area when this work would be conducted. Construction in agricultural fields required for other covered activities such as creation of managed marsh habitat or system-based conservation measures could occur during periods when Swainson's hawks are in the HCP area. The occurrence of these activities in agricultural fields would not affect foraging by Swainson's hawks. These hawks typically forage by spotting prey while flying and then diving to capture the prey. Because they often forage in association with operating farm equipment, they would not be disturbed by construction activities.

Depending on the water conservation measures and Salton Sea approach implemented, the amount of agricultural land in production could be reduced by about 15 percent. Potentially over the term of the permit a few individual Swainson's hawks could be taken as a result of reduced foraging habitat in the HCP area. Few Swainson's hawks occur in the HCP area and those that do occur are there for only brief periods during their spring or fall migrations. The USFWS (1997) characterizes them as occasional visitors with normally fewer than five individuals each season (spring and fall) at the Salton Sea NWR. Swainson's hawks commonly use alfalfa fields. In the Imperial Valley, the acreage of alfalfa has varied from about 158,000 to 222,000 (i.e., 27 to 43 percent of the agricultural land in the Imperial Valley). Because of the small numbers of hawks, the limited time period that they occur in the HCP area and the abundance of agriculture fields, the potential for and extent of take of Swainson's hawks expected from changes in the amount of agricultural land anticipated under this HCP would be minimal and would not substantially affect this species' population.

The minimal amount of potential take would be mitigated by implementation of the Tamarisk Scrub Habitat Conservation Strategy as well as the Agricultural Field Habitat Conservation Strategy. The greatest potential threat to foraging habitat for Swainson's

hawks in the HCP area would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley, and thereby continue to provide foraging opportunities for Swainson's hawks. In addition, IID would plant a cover crop on at least some of the lands that it owns and fallows which would attract small mammals on which Swainson's hawks prey. The Tamarisk Scrub Habitat Conservation Strategy could increase the accessibility of foraging habitat quality by providing perch sites near to foraging areas (see Section 3.4.6.4). In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.8.6.3 Greater Sandhill Crane

Installation of on-farm water conservation measures in agricultural fields would not be expected to affect greater sandhill cranes. On-farm conservation measures would be installed when crops were not being grown, primarily in the summer. Sandhill cranes only occur in the HCP area during the winter and therefore, would not be in the area when this work was being conducted.

Construction in agricultural fields required for other covered activities such as creation of managed marsh habitat or system-based conservation measures could occur during periods when sandhill cranes are in the HCP area. Construction activities have the potential to flush birds if the construction occurred in or adjacent to areas used by sandhill cranes for foraging which could constitute take as harassment or cause death or injury to individuals (e.g., if the flushed crane collided with a power line). Given the large amount of agricultural habitat available (about 500,000 acres), a relatively small number of cranes (200 to 300 birds), and limited amount of disturbance spread out over the term of the permit (e.g., disturbance of up to 652 acres to create the managed marsh, construction on 8,630 acres for system improvements), the likelihood of these activities occurring coincident with greater sandhill cranes is low. As such, the potential for and extent of take would be minimal.

Small numbers (up to 300 individuals) of greater sandhill cranes winter in the Imperial Valley. Depending on the water conservation measures implemented, the amount of agricultural land in production could be reduced by about 15 percent. Potentially over the term of the permit a few individual sandhill crane could be taken as a result of reduced foraging habitat in the HCP area. Wintering birds feed in irrigated croplands and pastures. Grains such as wheat, sorghum, barley, oats are important winter foods. The acreage of wheat in the Imperial Valley has fluctuated from 32,500 to about 175,000 acres. Sorghum, barley, and oats are minor commercial crops in the Imperial Valley. Cranes have continued to winter in the Imperial Valley through this wide fluctuation in the amount of wheat. The magnitude of the potential change in the total amount of agricultural land is within the range of variability in wheat and only a portion of fallowed agricultural land, if any, would consist of crops used by cranes. Further, the state and federal refuges plant cereal grains such as wheat, rye, and barley that provide foraging opportunities for cranes. Because of the small numbers of cranes, the abundance of agricultural fields, and management of lands on the refuges for grain, the potential for and extent of take of greater sandhill crane expected from changes in the amount of agricultural land anticipated under this HCP would be minimal and would not substantially affect this species' population.

The minimal amount of potential take would be mitigated by implementation of the Drain Habitat Conservation Strategy as well as the Agricultural Field Habitat Conservation Strategy. The greatest potential threat to foraging habitat for greater sandhill crane in the HCP area would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for sandhill crane. The Drain Habitat Conservation Strategy also could provide foraging habitat and protected roost sites (see Section 3.5.6.3). In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.8.6.4 Bank Swallow

Bank swallows are casual visitors to the HCP area, potentially occurring in the HCP area as migrants during the spring and fall. For foraging, they are not strongly associated with any particular habitat type, although they often forage near water where insects are abundant. The covered activities are unlikely to adversely affect bank swallows because of the swallow's rare occurrence in the HCP area and broad habitat use for foraging. However, a few individuals could be taken because of changes in foraging habitat availability or quality potentially resulting from permanent or temporary reductions in drain vegetation (see Section 3.5.2.2), permanent or temporary reductions in tamarisk scrub habitat (see Section 3.4.2), or changes in the composition and amount of agricultural field habitat.

The minimal amount of potential take would be mitigated by implementation of the Drain Habitat Conservation Strategy as well as the Agricultural Field Habitat Conservation Strategy. Critical to the perpetuation of agricultural field habitat in the Imperial Valley where bank swallows could forage is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for bank swallows. Loss of tamarisk scrub habitat at the Salton Sea and in the Imperial Valley would be offset through the creation/acquisition and long-term protection of native tree habitat (see Sections 3.3.4.2 and 3.4.5). By supporting more abundant and diverse insect populations than tamarisk scrub, native tree habitat would provide higher quality foraging opportunities for bank swallow. The Drain Habitat Conservation Strategy also would contribute to mitigating the impact of any take of bank swallows that could occur by increasing foraging opportunities through creation of managed marsh habitat (see Section 3.5.6.7). In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.8.6.5 Short-Eared Owl

Short-eared owls are rare winter visitors to the Salton Sea area, but are more common in the fall. Still, the number of owls occurring in the HCP area is small. The USFWS (1997) characterizes them as occasional visitors with normally fewer than five individuals at the Salton Sea NWR. Short-eared owls forage for small mammals in open habitats such as agricultural fields and marshes.

Short-eared owls are not expected to be affected by installation of water conservation measures in agricultural fields. On-farm conservation measures would be installed when crops were not being grown, primarily in the summer. Short-eared owls only occur in the HCP area during the fall and winter, and therefore, would not be in the area when this work was being conducted. Construction in agricultural fields required for other covered activities such as creation of managed marsh habitat or system-based conservation measures could occur during fall or winter. The occurrence of these activities in agricultural fields are unlikely to affect foraging by short-eared owls because owls primarily hunt at night when construction activities would not be occurring.

Depending on the water conservation measures implemented the amount of agricultural land in production could be reduced by about 15 percent. Potentially, over the term of the permit, a few individual short-eared owls could be taken as a result of reduced foraging habitat in the HCP area. Only a few short-eared owls use the HCP area as wintering habitat and migrants would only occur in the HCP area for brief periods of time. Short-eared owls commonly forage in alfalfa fields but also use pasture, marshes, and probably other grass-type crops such as wheat, Sudan grass, and Bermuda grass. In the Imperial Valley, the acreage of alfalfa has varied from about 158,000 to 222,000 (i.e., 27 to 43 percent of the agricultural land in the Imperial Valley). Because of the small numbers of owls and the abundance of agriculture fields, the potential for and extent of take of short-eared owls expected from changes in the amount of agricultural land anticipated under this HCP would be minimal and would not substantially affect this species' population.

The minimal amount of potential take would be mitigated by implementation of the Drain Habitat Conservation Strategy as well as the Agricultural Field Habitat Conservation Strategy. The greatest potential threat to foraging habitat for short-eared owls in the HCP area would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for short-eared owls. Short-eared owls also forage in marsh habitat. Through the creation of 190 to 652 acres of managed marsh habitat, the Drain Habitat Conservation Strategy could increase foraging habitat for short-eared owl. In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.8.6.7 Aleutian Canada Goose

Aleutian Canada geese occur in the HCP area as fall migrants and winter residents where they forage in the wetland areas around the Salton Sea and in the agricultural fields throughout the Imperial Valley. The primary overwintering area for this subspecies is in the San Joaquin Valley of California and use of the HCP area is limited.

Installation of on-farm water conservation measures in agricultural fields would not be expected to affect Aleutian Canada geese. On-farm conservation measures would be installed when crops were not being grown, primarily in the summer. Canada geese only occur in the HCP area during the fall and winter and therefore, would not be in the area when this work was being conducted. Construction in agricultural fields required for other

covered activities such as creation of managed marsh habitat or system-based conservation measures could occur during periods when geese are in the HCP area. Construction activities could flush birds if the construction occurred in or adjacent to areas used by Aleutian Canada geese for foraging which could constitute take as harassment or cause death or injury to individuals (e.g., if the flushed crane collided with a power line). Given the large amount of agricultural habitat available (about 500,000 acres), small number of Aleutian Canada geese, and limited amount of disturbance spread out over the term of the permit (e.g., disturbance of up to 652 acres to create the managed marsh, construction on 8,630 acres for system improvements), the likelihood of these activities occurring coincident with Aleutian Canada geese is low. As such, the potential for and extent of take would be minimal.

Depending on the water conservation measures implemented the amount of agricultural land in production could be reduced by about 15 percent. Potentially over the term of the permit a few individual Aleutian Canada geese could be taken as a result of reduced foraging habitat in the HCP area. Wintering birds are attracted to grain fields. In the Imperial Valley, grains are commercially produced but also are grown on the refuges specifically to provide forage for wintering geese. With management of the refuges for geese and the overall abundance of agricultural fields in the Imperial Valley, the potential for and extent of take of Aleutian Canada geese expected from changes in the amount of agricultural land anticipated under this HCP would be minimal and would not substantially affect this species' population.

The minimal amount of potential take would be mitigated by implementation of the Drain Habitat Conservation Strategy as well as the Agricultural Field Habitat Conservation Strategy. The greatest potential threat to foraging habitat for Aleutian Canada geese in the HCP area would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley, and thereby continue to provide foraging opportunities for Canada geese. The Drain Habitat Conservation Strategy also could provide foraging habitat and protected roost sites (see Section 3.5.6.4). In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.8.6.8 Ferruginous Hawk

Ferruginous hawks regularly occur in the Imperial Valley in small numbers during the winter. This species forages in agricultural fields for small mammals such as rabbits, ground squirrels, and mice. Ferruginous hawks would be expected to forage in a wide variety of crop types as long as prey were abundant and accessible.

Installation of water conservation measures in agricultural fields would not be expected to affect ferruginous hawks. On-farm conservation measures would be installed when crops were not being grown, primarily in the summer. Ferruginous hawks only occur in the HCP area during winter and therefore, would not be in the area when this work would be conducted. Construction in agricultural fields required for other covered activities such as creation of managed marsh habitat or system-based conservation measures could occur

when ferruginous hawks are in the HCP area. Ferruginous hawks might avoid foraging in areas where construction is occurring. Given the abundance of foraging habitat in the HCP area, individuals would be expected to be able to find alternative foraging locations.

Depending on the water conservation measures implemented, the amount of agricultural land in production could be reduced by about 15 percent. Potentially over the term of the permit a few individual ferruginous hawks could be taken as a result of reduced foraging habitat in the HCP area. Few ferruginous hawks occur in the HCP area. Even with a 15 percent reduction, the Imperial Valley would support about 425,000 acres of agricultural field habitat. Much of this acreage is expected to consist of crops favorable to foraging by ferruginous hawks (e.g., alfalfa). Given the small number of hawks and large amount of potential habitat, the potential for and extent of take of ferruginous hawk expected from changes in the amount of agricultural land anticipated under this HCP would be minimal and would not substantially affect this species' population.

The minimal amount of potential take would be mitigated by implementation of the Agricultural Field Habitat Conservation Strategy. The greatest potential threat to foraging habitat for ferruginous hawk in the HCP area would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for ferruginous hawks. In addition, IID would plant a cover crop on at least some of the lands that it owns and fallows which would attract small mammals on which ferruginous hawks prey. By enhancing the probability that wintering habitat will continue to be supported in the HCP area and by implementing measures for fallowed lands to enhance small mammal abundance, the HCP would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

#### 3.8.6.9 Western Snowy Plover

Western snowy plovers are year-round breeding residents and winter migrants at the Salton Sea. The Salton Sea supports the largest wintering population of snowy plovers in the interior western United States and one of only a few key breeding populations in interior California (Shuford et al. 1999). For foraging, snowy plovers use the shoreline of the Salton Sea, primarily concentrated on sandy beaches or alkali flats along the western and southern shorelines. They also could forage in agricultural fields in the valley.

Foraging birds could be displaced if construction activities to install on-farm or system-based conservation measures or create managed marsh were conducted in fields where the birds were foraging which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed they are subject to predation. Given the large amount of agricultural habitat available (about 500,000 acres), relatively small number of plovers (about 200 birds), and limited amount of disturbance spread out over the term of the permit (e.g., disturbance of up to 652 acres to create the managed marsh, construction on 8,630 acres for system improvements), the likelihood of these activities occurring coincident with snowy plovers is low. As such, the potential for and extent of take would be minimal.

Depending on the water conservation measures and Salton Sea approach implemented, the amount of agricultural land in production could be reduced by about 15 percent. Potentially a few individual plovers could be taken as a result of reduced foraging habitat in the HCP area. However, snowy plovers appear to prefer foraging at the Salton Sea and agricultural field habitat would remain abundant in the HCP area. As a result, the potential for and extent of take of snowy plovers expected from changes in the amount of agricultural land anticipated under this HCP would be minimal.

The minimal amount of potential take would be mitigated by implementation of the Agricultural Field Habitat Conservation Strategy. The greatest potential threat to the continued availability of agricultural field habitat in the HCP area would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for snowy plovers. In addition, IID would plant a cover crop or ridge till lands that it owns and fallows which would make insects accessible for snowy plovers. By enhancing the probability that wintering habitat will continue to be supported in the HCP area and by implementing measures for fallowed lands to enhance insect availability, the HCP would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

#### 3.8.6.10 Black Tern

Black terns are common at the Salton Sea during the spring, summer and fall; they rarely occur at the Sea during the winter (USFWS 1997b). The Salton Sea watershed is thought to be the most important staging area for black terns in the Pacific Flyway (Shuford et al. 1999). In addition to the Salton Sea, black terns are common summer residents and migrants in Imperial Valley with up to about 10,000 individuals foraging over irrigated agricultural fields at some times (Shuford et al. 1999).

Installation of water conservation measures in agricultural fields and construction of system-based conservation measures or managed marsh would not be expected to affect black terns. Black terns are attracted to agricultural fields during irrigations when insects are displaced and are easy to capture. Construction activities would not be conducted while the fields were being irrigated and therefore would not affect black terns.

Depending on the water conservation measures implemented the amount of agricultural land in production could be reduced by about 15 percent. Potentially a few individual terns could be taken as a result of reduced foraging habitat in the HCP area. Even with a 15 percent reduction, the Imperial Valley would support about 425,000 acres of agricultural field habitat. Because of the abundance of agricultural field habitat, the potential for and extent of take of black terns expected from changes in the amount of agricultural land anticipated under this HCP would be minimal and would not substantially affect this species' population.

The minimal amount of potential take would be mitigated by implementation of the Drain Habitat Conservation Strategy as well as the Agricultural Field Habitat Conservation Strategy. The greatest potential threat to perpetuation of agricultural field habitat where

black terns can forage in the HCP area is conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley, and thereby continue to provide foraging opportunities for black terns. The availability and quality of marshes for breeding is the primary factor affecting the population size (USFWS 1999). Under the Drain Habitat Conservation Strategy, 190 to 652 acres of managed marsh habitat would be created that could provide nesting opportunities as well as foraging habitat. In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

#### 3.8.6.11 Northern Harrier

Northern harriers are common fall and winter residents in the HCP area but occur only occasionally during the spring and summer. Throughout California, harriers commonly use agricultural fields, particularly alfalfa and pasture, in addition to native habitats such as native grasslands and marshes.

Installation of water conservation measures in agricultural fields would not be expected to affect northern harriers. On-farm conservation measures would be installed when crops were not being grown, primarily in the summer. Harriers predominantly occur in the HCP area during fall and winter and therefore, their occurrence in the area when this work would be conducted would be minimal. Construction in agricultural fields required for other covered activities such as creation of managed marsh habitat or system-based conservation measures could occur when northern harriers are in the HCP area. However, the occurrence of these activities in agricultural fields also would not be expected to affect foraging by northern harriers. Northern harriers might avoid foraging in areas where construction is occurring, but given the abundance of foraging habitat in the HCP area, individuals would be expected to be able to find alternative foraging locations.

Depending on the water conservation measures implemented the amount of agricultural land in production could be reduced by about 15 percent. Potentially over the term of the permit a few individual northern harriers could be taken as a result of reduced foraging habitat in the HCP area. Even with a 15 percent reduction, the Imperial Valley would support about 425,000 acres of agricultural field habitat. The abundance of agricultural field habitat is probably not a limiting factor for northern harriers in the Imperial Valley. Rather, the availability of breeding areas and habitat conditions at breeding areas probably have a much greater influence on the number of harriers wintering in the Imperial Valley (see e.g., Remsen 1978). Given the abundance of agricultural fields, the potential for and extent of take of harrier expected from changes in the amount of agricultural land anticipated under this HCP would be minimal and would not substantially affect this species' population.

The minimal amount of potential take would be mitigated by implementation of the Drain Habitat Conservation Strategy as well as the Agricultural Field Habitat Conservation Strategy. The greatest potential threat to foraging habitat for northern harrier in the HCP area would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability

and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for northern harrier. This species also forages in marsh habitat. Through the creation of 190 to 652 acres of managed marsh habitat, the Drain Habitat Conservation Strategy could increase foraging habitat for northern harrier. In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.8.6.12 Fulvous Whistling-Duck

The Salton Sea area has supported a population as high as about 200 whistling-ducks during the spring and summer, with a much smaller breeding population. They forage in marshes and irrigated agricultural field. In the Imperial Valley, alfalfa, corn, and grain fields could be used by whistling-ducks for foraging.

Installation of water conservation measures in agricultural fields and construction of system-based conservation measures or managed marsh have a minor potential to disturb fulvous whistling-ducks. These ducks could forage on grain remaining on fields after harvest. If construction occurred in or adjacent to fields where whistling-ducks were foraging, some individuals could be disturbed which could constitute take as harassment or cause death or injury to individuals (e.g., if the flushed ducks collided with a power line or were subject to predation). Given the large amount of agricultural habitat available (about 500,000 acres), relatively small number of whistling-ducks (up to 200 birds), and limited amount of disturbance spread out over the term of the permit (e.g., disturbance of up to 652 acres to create the managed marsh, construction on 8,630 acres for system improvements), the likelihood of these activities occurring coincident with fulvous whistling-ducks is low. As such, the potential for and extent of take would be minimal.

Fulvous whistling-ducks are not expected to be affected by the potential reduction in agricultural field habitat with implementation of the water conservation and transfer programs. As noted above, the HCP area supports a small population. The ducks predominantly use marshes and agricultural fields on the state and federal refuges. Thus, the reduction in agricultural fields potentially occurring with implementation of the water conservation and transfer programs and HCP would not be expected to adversely affect the whistling-duck population. The Drain Habitat Conservation Strategy would increase the amount of managed marsh habitat and mitigate the impact of any take of fulvous whistling-ducks caused by the covered activities (see Section 3.5.6.11).

### 3.8.6.13 White-Tailed Kite

White-tailed kites can occur in the HCP area throughout the year but in small numbers. The highest number of kites reported in one year in the Christmas Bird Count (1940 to 2000) was 10. The USFWS (1997) characterizes them as occasional visitors with normally fewer than five individuals each season (spring, fall, and winter) at the Salton Sea NWR. Their current breeding status in the HCP area is uncertain. They have bred in the HCP area previously, but have not been verified to breed there recently. White-tailed kites typically forage in agricultural fields and are known to roost in Bermuda grass fields.

Installation of water conservation measures in agricultural fields and construction of system-based conservation measures or managed marsh are unlikely to disturb white-tailed kites. In foraging, white-tailed kites hover in search of prey and then drop down to capture prey. White-tailed kites might avoid foraging in areas where construction is occurring. Given the abundance of foraging habitat in the HCP, individuals would be expected to be able to find alternative foraging locations. While white-tailed kites roost in Bermuda grass fields, construction activities would not be expected to affect roosting kites. Construction would not be conducted in fields in active agricultural production and therefore kites would not be expected to roost in areas subject to construction.

Depending on the water conservation measures implemented the amount of agricultural land in production could be reduced by about 15 percent. Potentially over the term of the permit a few individual white-tailed kites could be taken as a result of reduced foraging habitat in the HCP area. A small number of white-tailed kites occur in the HCP area. White-tailed kites forage in alfalfa, Sudan grass and Bermuda grass fields in the Imperial Valley. In the Imperial Valley, the acreage of alfalfa has varied from about 158,000 to 222,000 (i.e., 27 to 43 percent of the agricultural land in the Imperial Valley). Sudan grass and Bermuda grass currently collectively comprise about 25 percent of agricultural land in the valley. Thus, greater than 50 percent of the agricultural area provides potential foraging habitat. Because of the small numbers of kites and the abundance of agriculture fields, the potential for and extent of take of white-tailed kite expected from changes in the amount of agricultural land anticipated under this HCP would be minimal.

The minimal amount of potential take would be mitigated by implementation of the Tamarisk Scrub Habitat Conservation Strategy and Agricultural Field Habitat Conservation Strategy. The greatest potential threat to foraging habitat for white-tailed kites in the HCP area would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for white-tailed kites. In addition, IID would plant a cover crop on at least some of the lands that it owns and fallows which would attract small mammals on which white-tailed kites prey. The Tamarisk Scrub Habitat Conservation Strategy would increase the availability of nesting habitat and could contribute to white-tailed kites resuming breeding in the HCP area in the future (see Section 3.4.6.8). In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.8.6.14 Loggerhead Shrike

In the HCP area, loggerhead shrikes are associated with agricultural fields, as well as desert habitat. Shrikes use agricultural fields for foraging. Vegetation along agricultural drains, fence posts, and other natural and manmade structures along the margins of fields provide perch sites from which loggerhead shrikes forage. Drain vegetation also could support nesting. Tamarisk throughout the HCP area also could provide perching, roosting. and nesting opportunities although the level of use of tamarisk by loggerhead shrikes is uncertain.

IID has and will continue to conduct O&M activities of the drains. The vegetation currently supported in the drains is a product of these maintenance activities and use of this habitat by loggerhead shrike would occur in light of these activities. Although water conservation activities could reduce the amount and quality of water in the drains, this potential reduction is not expected to result in a substantial change in the extent and characteristics of vegetation in the drains. Thus, the drains would continue to provide perching, roosting, and nesting opportunities for loggerhead shrike at a level similar to existing conditions.

Several covered activities have the potential to directly or indirectly take loggerhead shrikes. Drain maintenance activities could flush loggerhead shrikes from drain vegetation which could constitute take as harassment or cause death or injury to individuals if as a result of being flushed from the cover of drain vegetation they are subject to predation. If loggerhead shrikes nest in drain vegetation, drain maintenance activities could destroy nests or disturb nesting birds.

On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. Some this vegetation could be used by loggerhead shrikes. With 80 percent of the drain vegetation undisturbed each year and considering IID would be actively cleaning only a fraction of the 20 percent of the drainage system during the breeding season, the potential for take and the level of take resulting from impacts to nesting birds (e.g., nest destruction) by drain maintenance activities is relatively low.

Drain maintenance activities and several other covered activities also have the potential to result in take of loggerhead shrikes through temporary or permanent reductions in the amount of tamarisk scrub habitat. As shown in Table 3.4-3, various maintenance and water conservation activities have the potential to temporarily impact about 43.2 acres of tamarisk scrub habitat and permanently impact about 65.5 acres. In addition, a reduction in the water surface elevation of the Salton Sea resulting from water conservation could impact up to 2,642 acres of tamarisk scrub habitat adjacent to the Salton Sea. These reductions in tamarisk scrub habitat could reduce nesting and perching opportunities for loggerhead shrikes if the habitat is located adjacent to suitable foraging habitat. Over the term of the permit, a few individuals could be adversely affected (e.g., killed, injured, or harmed) as a result of this reduction, but because of the abundance of tamarisk scrub in the HCP area (more than 7,500 acres), no adverse population-level effects would be expected.

Various construction activities anticipated by IID have the potential to remove tamarisk scrub habitat that could be used by loggerhead shrikes. Construction activities could displace individuals and result in take if displaced birds were unable to find alternate habitat or were exposed to other hazards (e.g., predation). Because of the abundance of tamarisk scrub habitat in the HCP area (more than 7,500 acres) and small amount of habitat that would be permanently impacted by construction activities (about 65 acres) over the term of the permit, the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal. If loggerhead shrikes nest in the HCP area, construction activities could result in the destruction of nests during habitat removal.

Under both the Tamarisk Scrub Habitat and Drain Habitat Conservation Strategy, IID will survey for covered species prior to conducting scheduled construction activities. If covered species, including loggerhead shrikes, are found breeding in habitat that would be impacted

by the construction, IID will schedule the construction to occur outside the breeding season. These measures will avoid and minimize potential take of nesting birds.

Construction activities to install on-farm or system-based water conservation techniques or managed marsh have a minor potential to affect shrikes. These activities could result in disturbance if shrikes are nesting in vegetation adjacent to construction activities. The potential for this effect is considered very low. The type of equipment used to install the systems (e.g., excavators, graders, dozers) is the same type of equipment that IID uses in conducting its O&M activities. Also, workers are routinely working in and adjacent to the fields. Thus, shrikes nesting adjacent to agricultural fields are probably accustomed to construction equipment and human activity.

Depending on the water conservation measures implemented the amount of agricultural land in production could be reduced by about 15 percent. Shrikes forage on a wide variety of prey, including insects, small birds, mice, reptiles, and spiders. With this broad diet, food availability is probably not limiting such that the potential for and extent of take of loggerhead shrikes expected from changes in the amount of agricultural land anticipated under this HCP would be minimal.

Potential take of loggerhead shrikes resulting from the covered activities would be avoided, minimized and mitigated through the Salton Sea Habitat Conservation Strategy, Tamarisk Scrub Habitat Conservation Strategy, Drain Habitat Conservation Strategy, Desert Habitat Conservation Strategy, and Agricultural Field Habitat Conservation Strategy. Under the Salton Sea and Tamarisk Scrub Habitat Conservation Strategies, native tree habitat will be created or acquired and preserved to compensate for reductions in the this habitat and thereby offset lost habitat value for loggerhead shrikes. Up to 652 acres of managed marsh will be created under the Drain Habitat Conservation Strategy. As provided for under the monitoring and adaptive management program, the composition of this habitat can be adjusted by the HCP IT to better accommodate the habitat needs of species found in the drains during baseline surveys. Thus, to the extent that loggerhead shrikes currently use the drains, their habitat needs would be considered in developing the managed marsh. This habitat will serve to mitigate impacts potentially resulting from drain maintenance activities on 130 acres each year and permanent loss 25 acres of drain vegetation from construction activities. The Desert Habitat Conservation Strategy also avoids and minimizes impacts to nesting birds and compensates for habitat reductions (see Section 3.6.6.7). Finally, the Agricultural Field Habitat Strategy provides for the long-term persistence of foraging habitat for loggerhead shrikes by enhancing the probability that agriculture will remain the predominant land use in the HCP area. In combination, these strategies would mitigate any take of loggerhead shrikes potentially occurring and would not jeopardize the continued existence of the species.

### 3.8.6.15 Long-Billed Curlew

Long-billed curlews are common, year-round residents in the HCP area but with a large wintering population (Shuford et al. 2000). The number of birds in the Imperial Valley and at the Salton Sea varies throughout the year. Shuford et al. (2000) reported a total of 5,593 individuals in December 1999 during a survey for mountain plovers that covered about 60 percent of the Imperial Valley. The highest count of long-billed curlews in the HCP area was nearly 7,500 birds in August 1995 (Shuford et al. 1999). It is not known to breed in the

HCP area (Shuford et al. 1999). In the Imperial Valley, long-billed curlews predominantly forage in agricultural fields during irrigations that increase the availability of insects. Curlews also forage on mudflats at the Salton Sea.

Installation of water conservation measures in agricultural fields and construction of system-based conservation measures or managed marsh would not be expected to affect long-billed curlews. Curlews are attracted to agricultural fields during irrigations when insects are displaced and are easy to capture. Construction activities would not be conducted while the fields were being irrigated and therefore would not affect long-billed curlews.

While farmers would implement various water conservation practices, these practices are not expected to change irrigation practices in a manner that would reduce habitat suitability for long-billed curlews. Curlews commonly forage in alfalfa fields and typically are attracted to these fields during irrigations. They tend to follow the advancing water and prey on insects displaced by the water. Under the water conservation and transfer project, surface irrigations would continue and thereby continue to provide conditions favorable to foraging by curlews. The improved efficiencies under the water conservation and transfer project would be manifested as a reduction in the amount of water leaving the field as tailwater.

Use of drip irrigation would change the manner in which fields are irrigated and potentially adversely affect foraging habitat quality for curlews. However, curlews concentrate foraging activities in alfalfa and drip irrigation is not an effective or efficient method for irrigating alfalfa. Therefore, drip irrigation would not be expected to be used to irrigate alfalfa and no adverse effects to foraging habitat availability of quality for long-billed curlews would result.

Depending on the water conservation measures implemented the amount of agricultural land in production could be reduced by about 15 percent. Potentially over the term of the permit a few individual long-billed curlews could be taken as a result of reduced foraging habitat in the HCP area. Even with a 15 percent reduction, the Imperial Valley would still support about 425,000 acres of agricultural field habitat. Because of the abundance of agricultural field habitat, it is unlikely that the amount of agricultural fields limits the population of long-billed curlews in the Imperial Valley. The availability of and quality of breeding habitat in the species' breeding range is believed to have been a primary cause of the species decline and is still a primary concern for this species. Given that it is unlikely that agricultural fields are limiting the level of use of the HCP area by long-billed curlews, the potential for and extent of take of long-billed curlews from changes in the amount of agricultural land anticipated under this HCP would be minimal.

The minimal amount of potential take would be mitigated by implementation the Agricultural Field Habitat Conservation Strategy. The greatest potential threat to foraging habitat for long-billed curlew in the HCP area would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for long-billed curlews. By enhancing the probability that habitat will continue to be supported in the HCP area, the HCP would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.8.6.16 White-Faced Ibis

White-faced ibis occur in the HCP area throughout the year but are most abundant in the winter. The HCP area supports a large wintering population of white-faced ibis. More than 24,000 ibis were recorded at the Salton Sea in 1999, representing about 50 percent of the California population. Agricultural fields are used extensively by ibis for foraging. Alfalfa appears to be the most commonly used crop type, although others such as wheat also are visited.

Installation of on-farm water conservation measures in agricultural fields would not be expected to affect white-faced ibis. On-farm conservation measures would be installed when crops were not being grown, primarily in the summer. The majority of the white-faced ibis using the HCP area occur in the area in the winter, with only a small breeding population. Thus, most of the birds would not be in the area when this work was being conducted. Impacts to ibis present during the summer also would not be expected because ibis forage in agricultural fields during irrigations and on-farm systems would not be installed when fields were being irrigated. For the same reason, construction in agricultural fields required for other covered activities such as creation of managed marsh habitat or system-based conservation measures would not affect ibis.

While farmers would implement various water conservation practices, these practices are not expected to change irrigation practices in a manner that would reduce habitat suitability for white-faced ibis. Ibis commonly forage in alfalfa fields and typically are attracted to these fields during irrigations. They tend to follow the advancing water and prey on insects displaced by the water. Under the water conservation and transfer project, surface irrigations would continue and thereby continue to provide conditions favorable to foraging by ibis. The improved efficiencies under the water conservation and transfer project would be manifested as a reduction in the amount of water leaving the field as tailwater.

Use of drip irrigation would change the manner in which fields are irrigated and potentially adversely affect foraging habitat quality for ibis. However, ibis concentrate foraging activities in alfalfa, and drip irrigation is not an effective or efficient method for irrigating alfalfa. Therefore, drip irrigation would not be expected to be used to irrigate alfalfa and no adverse effects to foraging habitat availability of quality for white-faced ibis would result.

Depending on the water conservation measures implemented the amount of agricultural land in production could be reduced by about 15 percent. Potentially over the term of the permit a few individual white-faced ibis could be taken as a result of reduced foraging habitat in the HCP area. Even with a 15 percent reduction, the Imperial Valley would still support about 425,000 acres of agricultural field habitat. This reduction in agriculture field habitat is not likely to affect white-faced ibis. Loss of marsh habitat and pesticides in breeding areas are believed to be the primary factors contributing to earlier declines in white-faced ibis, rather than conditions on wintering areas (Remsen 1987).

The number of white-faced ibis wintering in the Imperial Valley has increased substantially in the 1990s (Figure 3.8-5). Over the same period, the acreage of alfalfa showed no trend, but rather fluctuated within its historic range. These findings suggest that the population of white-faced ibis wintering in the Imperial Valley is not limited by the amount of foraging habitat (i.e., alfalfa). Given that the amount of agricultural land is not likely determining the size of the ibis population using the Imperial Valley, the potential for and extent of take of

white-faced ibis from changes in the amount of agricultural land anticipated under this HCP would be minimal.

The minimal amount of potential take would be mitigated by implementation of the Drain Habitat Conservation Strategy as well as the Agricultural Field Habitat Conservation Strategy. The greatest potential threat to foraging habitat for white-faced ibis in the HCP area would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for white-faced ibis. The Drain Habitat Conservation Strategy also could provide foraging and nesting habitat and protected roost sites (see Section 3.5.6.8). In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.8.6.17 Peregrine Falcon

Peregrine falcons are rare visitors to the HCP area. No cliffs or tall buildings that could provide nesting sites for peregrine falcons occur in the project area, thus use of the project area by peregrine falcons is limited to foraging. They have been observed foraging at managed marsh habitats of the Salton Sea NWR where they prey on wintering and migrating waterfowl. They may also prey on shorebirds and waterfowl at the Salton Sea and in agricultural fields.

Installation of water conservation measures in agricultural fields would not be expected to affect peregrine falcons because of this species' low level of use of the HCP area. Peregrine falcons might avoid foraging in areas where construction is occurring but given the abundance of foraging habitat in the HCP area, individuals would be expected to be able to find alternative foraging locations.

Depending on the water conservation measures implemented the amount of agricultural land in production could be reduced by about 15 percent. Potentially over the term of the permit a few individual peregrine falcons could be taken as a result of reduced foraging habitat in the HCP area. Few peregrine falcons occur in the HCP area. Even with a 15 percent reduction, the Imperial Valley would support about 425,000 acres of agricultural field habitat. Considering the small number of falcons and large amount of potential habitat, the potential for and extent of take of peregrine falcons from changes in the amount of agricultural land anticipated under this HCP would be minimal and would not substantially affect this species' population.

The minimal amount of potential take would be mitigated by implementation of the Agricultural Field Habitat Conservation Strategy and the Drain Habitat Conservation Strategy (see Section 3.5.6.6). The greatest potential threat to the continued availability of agricultural fields as foraging habitat in the HCP area would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby

continue to provide foraging opportunities for peregrine falcon. The Drain Habitat Conservation Strategy also would contribute to maintaining foraging habitat for peregrine falcons by providing habitat for waterfowl. In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

### 3.8.6.18 Golden Eagle

Golden eagles occur at the Salton Sea only as accidentals during the winter and spring. Much of the HCP area could be used by golden eagles for foraging; however, golden eagles are most likely to concentrate foraging activities in areas of high prey concentrations. In the HCP area, the Salton Sea and managed marsh at the state and federal wildlife refuges, as well as private duck clubs, attract abundant waterfowl populations during winter. Agricultural fields also attract waterfowl and golden eagles may forage in desert habitat as well.

Installation of water conservation measures in agricultural fields would not be expected to affect golden eagles because of this species' rare occurrence in the HCP area. Golden eagles might avoid foraging in areas where construction is occurring but given the abundance of foraging habitat in the HCP area, individuals would be expected to find alternative foraging locations.

Depending on the water conservation measures implemented the amount of agricultural land in production could be reduced by about 15 percent. Potentially over the term of the permit a few individual golden eagles could be taken as a result of reduced foraging habitat in the HCP area. Few golden eagles occur in the HCP area. Even with a 15 percent reduction, the Imperial Valley would support about 425,000 acres of agricultural field habitat. Considering the small number of golden eagles and large amount of potential habitat, the potential for and extent of take of golden eagles from changes in the amount of agricultural land anticipated under this HCP would be minimal and would not substantially affect this species' population.

The minimal amount of potential take would be mitigated by implementation of the Agricultural Field, Drain (see Section 3.5.6.12), and Desert Habitat Conservation Strategies (see Section 3.6.6.10). The greatest potential threat to the continued availability of agricultural fields as foraging habitat in the HCP area would be conversion of agricultural lands to nonagricultural uses, particularly urban land uses. Critical to the perpetuation of agriculture in the Imperial Valley is the reliability and availability of water. Implementation of the water conservation and transfer program and this HCP will enhance the likelihood that agriculture will remain the dominant land use in the Imperial Valley and thereby continue to provide foraging opportunities for golden eagles. Under the Desert Habitat Conservation Strategy reductions in habitat would be mitigated through acquisition and protection of native desert habitat which would provide foraging opportunities for golden eagle over the long term. The Drain Habitat Conservation Strategy also would contribute to maintaining foraging habitat for golden eagles by providing habitat for waterfowl. In combination, these strategies would mitigate the minimal amount of take potentially occurring and would not jeopardize the continued existence of the species.

# 3.9 Other Covered Species

Of the 96 species covered by this HCP, the USFWS and CDFG identified 25 species for which existing information on the ecology and distribution in the HCP area is limited or that might not occur in the HCP area. These species are listed in Table 3.9-1. The approach to covering these species is to implement a research program to better understand the presence, distribution, and ecological requirements of these species in the HCP area. Based on the results of the research program, IID will implement measures to avoid, minimize, and mitigate the impacts of any take of these activities resulting from the covered activities.

**TABLE 3.9-1**
Covered Species Addressed Separately from the Habitat-Based and Species-Specific Conservation Strategies

| | | |
|---|---|---|
| Cheeseweed moth lacewing | Western small-footed myotis | Yuma hispid cotton rat |
| Andrew's dune scarab beetle | Occult little brown bat | Jacumba little pocket mouse |
| Colorado River toad | Southwestern cave myotis | Banded gila monster |
| Lowland leopard frog | Yuma myotis | Flat-seeded spurge |
| Mexican long-tongued bat | Western mastiff bat | Orcutt's aster |
| California leaf-nosed bat | Pocketed free-tailed bat | Foxtail cactus |
| Pallid bat | Big free-tailed bat | Munz's cactus |
| Pale western big-eared bat | Colorado River hispid cotton rat | Orocopia sage |
| Spotted bat | | |

## 3.9.1 Measures for the Other Covered Species

***Other Species–1.*** *IID will implement a study program for the species listed in Table 3.9-1 in the HCP area. IID will work with the HCP IT to define the specific surveys and studies to be conducted. Within three years of issuance of the ITPs, IID will submit a detailed description of the study program to the USFWS and CDFG for approval. IID will implement the studies within 1 year of approval by the USFWS and CDFG.*

To ensure that appropriate and effective conservation measures are implemented for these species, IID will implement a study program designed by the HCP IT to determine the specific occurrence and habitat requirements of these species in the HCP area. The study program will determine the distribution of the covered species listed in Table 3.9-1 in the HCP area. For those species determined to occur in the HCP area, the study program also will provide information on their specific habitat requirements in the HCP. This information will be used in developing appropriate avoidance, minimization and mitigation measures (see Other Species–2).

***Other Species–2.*** *Prior to completion of the study program, IID will implement the species-specific avoidance, minimization and mitigation measures contained in Appendix H. Within six months of completion of the study program or discrete species-specific components of the study program, the HCP IT will meet to review the results. Based on the results of the study program, the HCP IT will*

- *Assess the potential effects of the covered activities on each of the species listed in Table 3.9-1*
- *Recommend measures to avoid, minimize, and mitigate the impacts of the covered activities as necessary to meet the issuance criteria for state and federal incidental take permits*
- *Develop compliance and effectiveness monitoring and adaptive management programs*
- *Identify any additional studies necessary to develop measures to meet the issuance criteria*

*IID will prepare a report that describes the results of the studies, the impacts of the covered activities on the covered species, and proposes avoidance, minimization, and mitigation measures for those impacts. IID will submit the report to the USFWS and CDFG for approval of the measures. IID will implement revised measures immediately upon approval by the USFWS and CDFG.*

*Prior to completion of the study program or species-specific components of the study program, the HCP IT will annually review the results of the study program. Based on this review the HCP IT may recommend adjustments to the avoidance, minimization, and mitigation measures contained in Appendix H. IID will submit an annual report of the study results and the proposed interim measures to the USFWS and CDFG for approval. IID will implement revised measures immediately upon approval by the USFWS and CDFG.*

With the information gained through Other Species–1, the HCP IT will be able to better define the potential impacts to these species from IID's covered activities. This information also will be important to refining measures to avoid, minimize, and mitigate potential effects of the covered activities on the covered species listed in Table 3.9-1. In the interim, prior to completion of the species-specific study programs, IID will implement the avoidance, minimization, and mitigation measures contained in Appendix H. The final measures to be implemented will be developed in coordination with the USFWS and CDFG as part of the HCP IT and will be subject to their approval. Figure 3.9-1 illustrates the process for implementing the study program, using the information obtained in the study program to develop avoidance and mitigation measures, and obtaining approval from the USFWS and CDFG for the measures.

## 3.9.2 Effects to the Other Covered Species

Implementation of Other Species–1 and –2 will provide an overall benefit to these covered species for two principal reasons. First, the habitat requirements and distribution of these species are poorly understood. The information gained through the study program will make a substantial contribution to understanding these species. This information will be valuable in developing management strategies for these species in other portions of their ranges and thereby contribute to the conservation of these species beyond the limits of the HCP area.

Second, under the HCP, IID is committing to implementing measures to avoid, minimize, and mitigate potential effects of covered activities on these species. In the absence of these measures, any adverse effects of the covered activities to these species would continue.

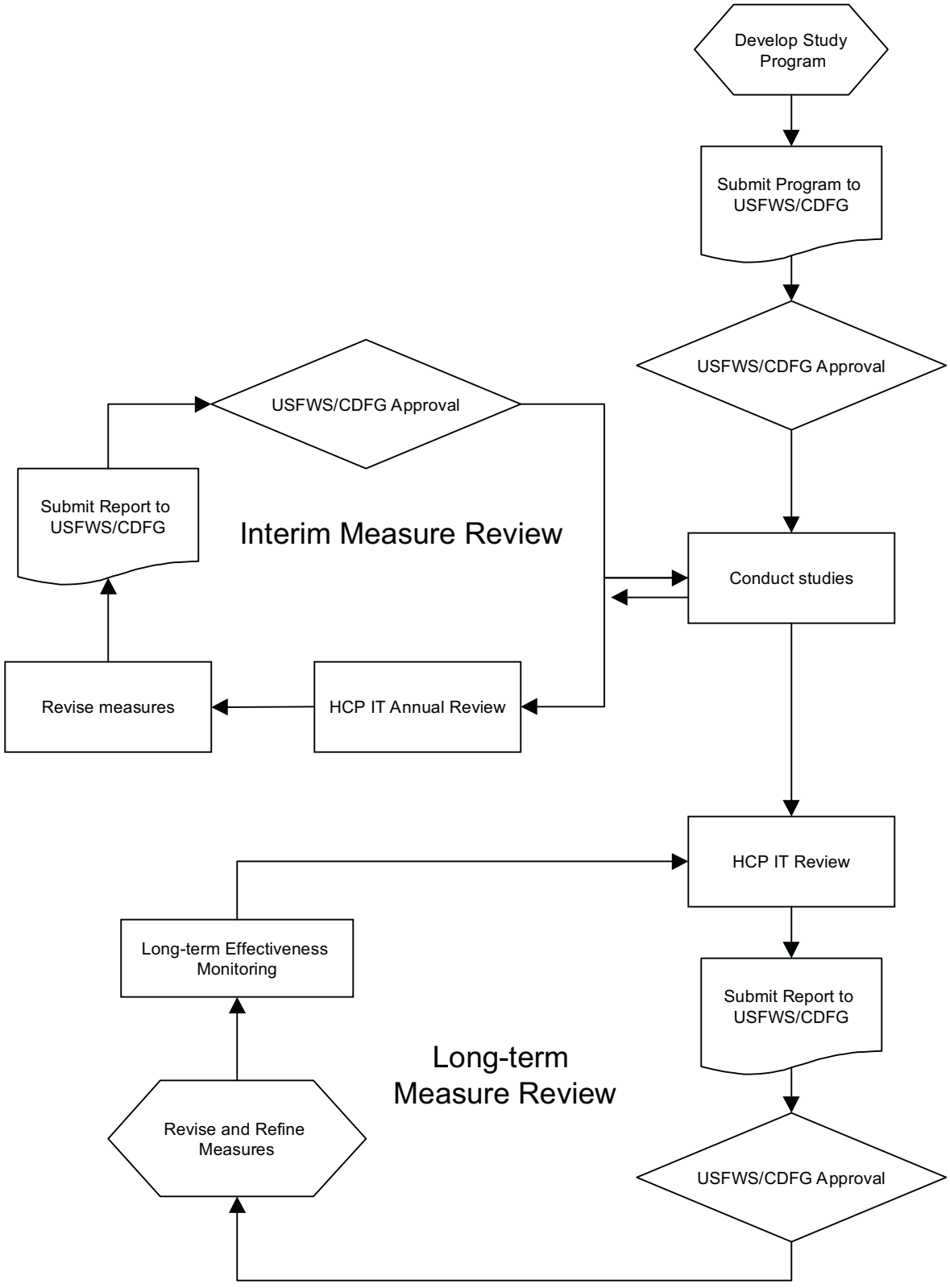



**Figure 3.9-1**
**Process for Refining Measures for the other Covered Species**

Because none of the covered species in Table 3.9-1 are currently listed, they are afforded minimal to no protection under state or federal law. An individual species could receive protection in the future if it was listed. However, it is uncertain whether any of these covered species would be listed in the future. Also, protection afforded by listing of one of the covered species would extend only to the species actually listed. The remaining covered species would remain vulnerable. The certainty that protective measures would be implemented over an extended period of time (75 years) would provide a long-term benefit to these species in the HCP area, contribute to improved management elsewhere, and possibly prevent the need to list them in the future.

As part of the Monitoring and Adaptive Management Program (Chapter 4), IID could implement a survey or study program requiring capture of covered species. Capture of covered species constitutes take under both the federal and state ESAs. Take that occurs in association with surveys or studies conducted for this HCP is a covered activity and will be authorized under the state and federal ITPs. Any of the covered species could be taken through surveys or studies.

Studies and surveys conducted during the course of this HCP will be developed by IID in coordination with the HCP IT and will be subject to the approval of CDFG and USFWS prior to implementation. In approving the studies/surveys, the CDFG and USFWS will require capture methods that minimize the potential for death and injury of covered species. In addition, these agencies will specify the number of individuals of covered species that may be captured. Thus, the level of take authorized to occur through this mechanism will be specified on a case-by-case basis through the approval of the CDFG and USFWS.

#### 3.9.2.1 Cheeseweed Moth Lacewing

This species is rarely observed in the field. Although infrequently observed, the moth lacewing may exist at many undocumented sites throughout the arid southwest region of the United States. The larval stage is associated with creosote bush. All collections of mature larvae and egg cases have produced specimens that were found inhabiting the root mass of this plant (USBR, 1996). The creosote bush scrub community is widespread throughout the nonirrigated areas of the Sonoran Desert. This habitat type surrounds the Salton Sea between the higher rock hillsides and the more saline desert saltbrush community. Suitable habitat likely exists in the HCP area in desert habitats adjacent to the AAC; however, no emergence sites have been documented for this area (USBR, 1996).

The primary mechanism through which the covered activities could result in take of cheeseweed moth lacewings is construction activities in desert scrub habitats that remove existing creosote bushes. Over the term of the permit, IID anticipates replacing all of the structures along the AAC and East Highline Canal at least once. Construction to replace structures and potentially install canal lining could result in take of a cheesweed moth lacewing through removal of creosote bushes. Over the term of the permit, scheduled construction activities will not permanently remove more than 100 acres of native desert habitat. Only a portion of this habitat would consist of creosote bushes and be potentially suitable for cheeseweed moth lacewings.

Under the Desert Habitat Conservation Strategy, IID would restrict O&M to previously disturbed areas and conduct regular vegetation control in disturbed areas to inhibit establishment creosote bushes (Desert Habitat–2). Similarly, IID would restrict scheduled construction activities to previously disturbed areas to the extent possible (Desert Habitat–3). Collectively, these measures would minimize the potential that IID's activities would remove a creosote bush that was inhabited by cheeseweed moth lacewings or that provide potential habitat. For all scheduled construction activities, the construction site would be surveyed to determine the occurrence of native desert habitat. To avoid impacts to the cheeseweed moth lacewing, creosote shrubs will be avoided during construction if possible (Appendix H). If shrubs cannot be avoided, and they are known or suspected to be inhabited by cheeseweed moth lacewings, IID will work with CDFG and USFWS to transplant the shrubs or acquire and protect suitable habitat in accordance with Desert Habitat–5. Through these measures, impacts to cheeseweed moth lacewing would be avoided or appropriately mitigated.

In addition to these measures, as part of the Other Species Conservation Strategy, IID would implement a study program to better understand the ecology and distribution of this species. Based on the results of the study program, the HCP IT would review the avoidance, minimization, and mitigation strategy for the cheeseweed moth lacewing and recommend adjustments if necessary to improve the effectiveness of the measures.

Covered activities conducted by IID have the potential to take cheeseweed moth lacewings in the immediate vicinity of the AAC and other canals adjacent to desert habitat (Trifolium Extension, Thistle, Westside Main, and East Highline). Cheeseweed moth lacewings have not been observed within the HCP area and have been only infrequently observed in other areas. Habitat for the lacewing in the HCP area constitutes a small portion of the total availability of creosote shrub habitat in the region. A maximum of 100 acres of native desert habitat, some of which could be inhabited by cheeseweed moth lacewings, could be affected. With implementation of the Desert Habitat Conservation Strategy measures and species-specific measures, implementation of the HCP would avoid, minimize, and mitigate potential impacts to this species and would not jeopardize its continued existence.

#### 3.9.2.2 Andrew's Dune Scarab Beetle

The Andrew's dune scarab beetle is endemic to the creosote bush scrub habitats of the Algodones Dunes in Imperial County, California. This species inhabits both surface and subsurface sand, utilizing the wet sand interface as protection from heat of the day. This beetle specifically inhabits troughs of loose drifting sand between the dunes. Suitable habitat for Andrew's dune scarab beetles in the HCP area occurs in the right-of-way of the AAC for the 10 miles that the AAC traverses the Algodones Dunes.

The only O&M activity with the potential to impact to Andrew's dune scarab beetles is the canal maintenance IID conducts along the portion of the AAC that traverses the Algodones Dunes. IID annually contours portions of the sand dunes, creating a flatter slope that allows sand to blow across the canal. In conducting this flattening, a bulldozer drags an I-beam back and forth across the peaks of the dunes to level them. The area where this activity is conducted begins at the Coachella Turnout (Sta. 1907+20) and extends to about Sidewinder Road at Pilot Knob (Sta. 1243+65), a distance of 12.56 miles. The area actually disturbed is about 50 to 75 feet wide yielding a total acreage disturbed of 76 to 114 acres. This acreage represents less than 0.1 percent of the 150,000 acres of the Algodones Dunes that could

provide habitat for this species. Andrew's dune scarab beetles could be crushed or displaced by this activity. The remaining O&M activities are restricted to previously disturbed areas (i.e., roadways and canal embankments) where Andrew's dune scarab beetles would not be expected to occur because these areas consist of well compacted soil that is not suitable for this species.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace these structures could remove dune scarab beetles. Over the term of the permit, scheduled construction activities will not permanently remove more than 100 acres of native desert habitat. Impacted habitat would be distributed along the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals that are adjacent to desert habitat. Because potential habitat for Andrew's dune scarab beetles in the HCP area is limited to the 10 miles of the AAC in the Algodones Dunes, the potential loss of habitat for Andrew's dune scarab beetles would be considerably less than 100 acres.

Under the Desert Habitat Conservation Strategy, IID would restrict O&M to previously disturbed areas (Desert Habitat–2). Similarly, IID would restrict scheduled construction activities to previously disturbed areas to the extent possible (Desert Habitat–3). Collectively, these measures would minimize the potential that IID's activities would impact dune beetles. For scheduled construction activities, IID would survey the construction site if reliable survey methods are available to determine if the site was used by dune beetles (Appendix H). If dune beetles were found, IID would configure the construction activities to avoid occupied areas to the extent possible. If dune habitat would be permanently lost, IID would acquire and protect dune habitat in accordance with Desert Habitat–5. Through these measures, impacts to Andrew's dune scarab beetles would be minimized, avoided, or appropriately mitigated.

In addition to these measures, as part of the Other Species Conservation Strategy, IID would implement a study program to better understand the ecology and distribution of this species. Based on the results of the study program, the HCP IT would review the avoidance, minimization, and mitigation strategy for the Andrew's dune scarab beetle and recommend adjustments if necessary to improve the effectiveness of the measures.

Covered activities conducted by IID have the potential to take Andrew's dune scarab beetles in the immediate vicinity of the AAC where the canal crosses the Algodones Dunes. Habitat for dune scarab beetles in the HCP area constitutes a small portion of the total habitat for this species in the Algodones Dunes. Under the HCP, IID would implement measures to minimize and avoid take of Andrew's dune scarab beetles and to compensate for reductions in suitable habitat. Therefore, implementation of the HCP which would serve to further reduce potential impacts and would not jeopardize the continued existence of Andrew's dune scarab beetles.

#### 3.9.2.3 Colorado River Toad

Colorado River toads are found in a variety of desert and semiarid habitats including brushy desert with creosote bush and mesquite washes, semiarid grasslands, and woodlands. It is semiaquatic and usually associated with large, permanent, or semipermanent streams. It is occasionally found near small springs, temporary rain pools,

human-made canals, and irrigation ditches. Primary breeding habitat for the Colorado River toad is moderately large streams, but it is also known to breed in temporary rain pools, and human-made watering holes and irrigation ditches.

In the HCP area, native desert habitats are restricted to along the AAC, East Highline Canal, and sections of the Westside Main, Thistle, and Trifolium Extension canals. These toads could use desert washes near these canals or seepage communities that occur in some locations along these canals. Agricultural drains have the potential to be used by these toads, and the toads could use areas adjacent to the New and Alamo rivers, although their use of tamarisk has not been determined. In general, however, Colorado River toads would be expected to occur along the AAC closer to the Colorado River rather than in the Imperial Valley portions of the HCP area. Surveys conducted under the Conservation Strategy for the 25 other covered species (Other Species–1) will provide information on the presence of suitable habitat and occurrence of this species throughout the HCP area.

Several covered activities have the potential to directly or indirectly take Colorado River toads. Vehicle strikes during O&M or construction activities could result in take of toads. If Colorado River toads are using the drains as habitat, direct impacts to eggs, larvae, or adults could occur during drain maintenance activities. On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. However, only a small amount of this vegetation likely would be suitable for Colorado River toads.

Of greater concern is the potential for construction activities to eliminate breeding ponds. Installation of seepage recovery systems on the East Highline Canal are not expected to impact Colorado River toads because the recovery systems are proposed for the west side of the canal and desert habitat occurs on the east side of the canal. Further, the seepage communities adjacent to the west side of the East Highline do not support standing water that these toads require for breeding. Seepage communities on the east side of the East Highline Canal which are adjacent to desert habitat would not be affected by the proposed seepage recovery systems.

Scheduled construction activities along the canals adjacent to desert habitat would not remove more than 100 acres of native desert habitat (Desert Habitat–5). Potentially, ponds suitable for breeding by Colorado River toads could occur along the AAC and some of the 100 acres potentially impacted by construction could support breeding ponds. As part of the habitat surveys that could be conducted for Desert Habitat Conservation Strategy (see Section 4.4.1.1) and the species-specific study program that would be implemented as part of the Other Species Conservation Strategy, potential breeding ponds for this species would be identified.

Breeding ponds are a critical habitat feature for Colorado River toads. Because of the believed scarcity of suitable ponds and uncertainty about the number and distribution of suitable ponds in the HCP area, IID will obtain written approval from the USFWS and CDFG if it proposes to impact a breeding pond. In deciding whether to approve the request, the USFWS and CDFG will consider the availability of other breeding ponds in the HCP area and the overall status of the species. The baseline surveys will provide the information necessary for USFWS and CDFG to determine if a breeding pond could be eliminated (e.g., number, size, and location of breeding ponds) without causing substantial adverse effects to the species.

To mitigate the impact to Colorado River toads from removal of breeding ponds, if approved by the USFWS and CDFG, IID would acquire, protect and manage in perpetuity two breeding ponds for every pond impacted. With the requirement for IID to receive approval from the USFWS and CDFG prior to eliminating a breeding pond and the requirement to protect two ponds for every one impacted, the number of ponds that could be impacted would be limited. The long-term protection of breeding ponds in the event that a pond would be removed would offset impacts to Colorado River toads by providing habitat for this species in perpetuity. Further, USFWS and CDFG would not approve removal of a pond if it would substantially adversely affect the species. Based on the believed low level of use of the HCP area by Colorado River toads, the potential for take of this species is low.

Drain maintenance activities and several other covered activities also have the potential to result in take of Colorado River toads through temporary or permanent reductions in the amount of drain habitat. As described in Section 3.5.2.2, various maintenance and water conservation activities have the potential to temporarily and permanently impact drain vegetation. In total, an estimated 25.1 acres of drain vegetation could be permanently impacted. These temporary and permanent reductions in drain habitat could result in a minor reduction in potential habitat for Colorado River toads. It is unknown whether Colorado River toads currently use the drains.

Under the HCP, IID will create at least 190 acres and up to 652 acres of managed marsh habitat (Drain Habitat–1). The created habitat will be of equal or better quality for Colorado River toads because it would have better water quality than the drains, and could be configured to provide more suitable habitat conditions than provided in the drains. Based on the results of the species-specific study program for Colorado River toads, the HCP IT could configure a portion of the managed marsh habitat specifically to provide habitat for this species. At the HCP IT's discretion and with approval from the USFWS and CDFG, Colorado River toads could be introduced into the managed marsh which would encourage the establishment of another population of this species. To the extent that IID's drainage system currently provides habitat for Colorado River toads, habitat would continue to be available in the drains with implementation of the HCP. Therefore, the created marsh would act to increase the amount of habitat for Colorado River toads in the HCP area and thereby benefit the species. Implementation of the minimization and avoidance measures, and creation of high quality managed marsh habitat, would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of Colorado River toads.

### 3.9.2.4 Lowland Leopard Frog

The lowland leopard frog has not been found in surveys in California since 1965 (Clarkson and Rorabaugh 1989, USFWS 1999) and is considered extirpated from southeastern California. Lowland leopard frogs have the potential to occur in the proposed project area in the future as a result of additional introductions or migration from reintroduced populations.

Lowland leopard frogs are generally associated with small streams and marshes that support emergent vegetation. In the HCP area, suitable habitat could occur in the wetlands on the state and federal refuges and wetlands adjacent to the Salton Sea. The New and Alamo rivers probably do not provide suitable habitat conditions due to their large size. However, portions of the agricultural drainage system that support cattails could provide suitable conditions.

If lowland leopard frogs are using the drains as habitat, direct impacts to eggs, larvae, or adults could occur during drain maintenance activities. On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. However, only a small amount of this vegetation might be suitable for lowland leopard frogs. Drain maintenance activities and several other covered activities also have the potential to result in take of lowland leopard frogs through temporary or permanent reductions in the amount of drain habitat. As described in Section 3.5.2.2, various maintenance and water conservation activities have the potential to temporarily and permanently impact drain vegetation. In total, an estimated 25.1 acres of drain vegetation could be permanently impacted. These temporary and permanent reductions in drain habitat could result in a minor reduction in potential habitat for lowland leopard frogs.

Under the HCP, IID will create at least 190 acres and up to 652 acres of managed marsh habitat (Drain Habitat–1). The created habitat will be of equal or better quality for lowland leopard frogs because it will contain preferred vegetation (i.e., cattails) and have better water quality than the drains. Based on the results of the species-specific study program for lowland leopard frogs, the HCP IT could configure a portion of the managed marsh habitat specifically to provide habitat for this species. At the HCP IT's discretion and with approval from the USFWS and CDFG, lowland leopard frogs could be introduced into the managed marsh which would encourage the establishment of another population of this species. To the extent that IID's drainage system currently provides habitat, potential habitat for lowland leopard frogs would continue to be available in the drains with implementation of the HCP. Therefore, the created marsh would act to increase the amount of habitat for lowland leopard frogs in the HCP area and thereby benefit the species. Limitation of maintenance activities to a small fraction of the drain habitat on an annual basis, and creation of high-quality managed marsh habitat, would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of lowland leopard frogs.

### 3.9.2.5 Mexican Long-Tongued Bat

The Mexican long-tongued bat occurs in a variety of habitats, ranging from arid scrub habitats to mixed oak-conifer forests (Arroyo-Cabrales et al. 1987) and semidesert grasslands (Cryan and Bogan 2000). It favors desert canyons with riparian vegetation. A variety of roost sites are used, including caves, mines, buildings, and trees. Most roost sites are located near a water source and near areas of riparian vegetation (Cryan and Bogan 2000). Caves, mines, and probably buildings are used as nursery sites. This species forages in desert and montane riparian, desert scrub, desert succulent shrub, and pinyon-juniper habitats.

Desert scrub is widespread throughout the nonirrigated areas of the Sonoran Desert. This habitat type surrounds the Salton Sea between the higher rock hillsides and the more saline desert saltbrush community. Succulent shrubs comprise a minor component of the vegetation community such that foraging habitat for Mexican long-tongued bats could be limited. The only portion of the HCP area that supports desert scrub habitat is in the rights-of-way of the AAC, East Highline Canal, and portions of the Westside Main, Thistle, and Trifolium Extension Canals. Where succulents occur along these canals, long-tongued bats may find suitable foraging conditions. A few areas along the AAC support cottonwoods and other trees that could provide roosting sites.

Potential impacts of IID's covered activities on this species relate principally to removal of foraging or roosting habitat. Under the Desert Habitat Conservation Strategy, IID would restrict O&M to previously disturbed areas (Desert Habitat–2). Similarly, IID would restrict scheduled construction activities to previously disturbed areas to the extent possible (Desert Habitat–3). Collectively, these measures would minimize the potential that IID's activities would impact foraging or roosting habitat for these bats.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace these structures could remove foraging habitat which could result in take of Mexican long-tongued bats. Under Desert Habitat–5, IID has committed to permanently remove no more than 100 acres of native desert habitat. Potentially impacted habitat would be distributed throughout the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals that are adjacent to desert habitat. Potential habitat for long-tongued bats in the HCP area is limited to areas of desert scrub habitat supporting succulents. Thus, the potential loss of foraging habitat for Mexican long-tongued bats would be considerably less than 100 acres and would not be expected to substantially affect foraging opportunities for this species.

As part of the species-specific study program implemented under Other Species–1, foraging habitat for this species in the HCP area would be determined. Prior to the start of construction activities, IID would determine if foraging habitat for long-tongued bats occurs within the construction area and would be impacted by construction activities. If construction impacts to foraging habitat cannot be avoided, IID would consult with CDFG and USFWS to identify other areas of suitable foraging habitat. The baseline surveys (Other Species–1) would provide the information necessary for USFWS and CDFG to determine which areas provide suitable foraging habitat for Mexican long-tongued bats. IID would mitigate for permanent loss of foraging for Mexican long-tongued bats by acquiring or granting a conservation easement on other suitable foraging habitat within the immediate vicinity of identified roost sites at a 3:1 ratio for the acreage impacted.

Day and night roosts are important habitat features for Mexican long-tongued bats. Because of the scarcity of suitable roosting sites and uncertainty about the number and distribution of suitable roosts in the HCP area, IID would obtain written approval from the USFWS and CDFG if it proposes to impact a roosting site. In deciding whether to approve the request, the USFWS and CDFG would consider the availability of other roosting sites in the HCP area and the overall status of the species. The baseline surveys (Other Species–1) would provide the information necessary for USFWS and CDFG to determine whether a roosting site could be eliminated without causing substantial adverse effects to the species. No impacts to maternity roosts would be authorized.

To mitigate the impact to Mexican long-tongued bats from removal of roosting sites, if approved by the USFWS and CDFG, IID would acquire, protect, and manage in perpetuity one roosting site for every roost site eliminated. With the requirement for IID to receive approval from the USFWS and CDFG prior to eliminating a roost site and the requirement to protect one roost site for every one eliminated, the number of roost sites that could be impacted would be limited. The long-term protection of roosting sites, in the event that a site would be removed, would offset impacts to Mexican long-tongued bats by providing roost sites for this species in perpetuity. Further, USFWS and CDFG would not approve removal of a roost site if it would substantially adversely affect the species. Based on the

expected low level of use of the HCP area by Mexican long-tongued bats, the potential for take of this species is low. This assumption will be evaluated as part of the Other Species Conservation Strategy and the HCP IT may revise the avoidance, minimization, and mitigation measures if necessary to improve the effectiveness and efficiency of the measures. Implementation of the HCP would not jeopardize the continued existence of Mexican long-tongued bats.

#### 3.9.2.6 California Leaf-Nosed Bat

California leaf-nosed bats occur in arid regions, using habitats such as desert scrub, alkali scrub, desert washes, riparian associations, and palm oases (Zeiner et al. 1990). The California leaf-nosed bat is known from caves, mines, and rock shelters, mostly in Sonoran desert scrub (AGFD 1997d). During winter months, the California leaf-nosed bat forms large colonies in only a few geothermally heated mines in the deserts of the Southwest (Brown and Berry 1991). This species requires warm roosts with temperatures of 80.6°F or more due to its inability to lower its body temperature and become torpid (Bell 1985). Maternity colonies are generally located in mines with temperatures that reach 80.6° to 89.6°F. The species uses separate daytime and nighttime roosts. Day roosts are often in deeper caves or mines and occasionally in abandoned structures (Zeiner et al. 1990). Night roosts are in bridges, mines, buildings, overhangs, or other structures with overhead protection (Zeiner et al. 1990). The presence of woody riparian vegetation, such as mesquite, ironwood, and paloverde, is required in foraging areas.

California leaf-nosed bats use caves and mines as day roosts. The only mine shafts in the area occur near Hedges, at the southwestern tip of Cargo Muchacho Mountains. Plant species preferred for foraging (mesquite, paloverde, ironwood) are rare in the HCP area and restricted to scattered patches along the AAC and East Highline Canal. It is unknown whether they forage in riparian areas dominated by tamarisk.

Potential impacts of IID's covered activities on this species relate principally to removal of foraging habitat. Under the Desert Habitat Conservation Strategy, IID would restrict O&M to previously disturbed areas (Desert Habitat–2). Similarly, IID would restrict scheduled construction activities to previously disturbed areas to the extent possible (Desert Habitat–3). Collectively, these measures would minimize the potential that IID's activities would impact foraging habitat for these bats.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace these structures could remove foraging habitat which could result in take of California leaf-nosed bats. Under Desert Habitat–5, IID has committed to permanently remove no more than 100 acres of native desert habitat. Potentially impacted areas would be distributed along the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals that are adjacent to desert habitat. Potential habitat for leaf-nosed bats in the HCP area is limited to scattered areas of along the AAC and East Highline Canal. Thus, the potential loss of foraging habitat for California leaf-nosed bats would be considerably less than 100 acres and would not be expected to substantially affect foraging opportunities for this species.

As part of the species-specific study program implemented under Other Species–1, foraging habitat for this species in the HCP area would be determined. Prior to the start of construction

activities, IID would determine whether foraging habitat for California leaf-nosed bats occurs within the construction area and would be impacted by construction activities. If construction impacts to foraging habitat cannot be avoided, IID will consult with CDFG and USFWS to identify other areas of suitable foraging habitat. The baseline surveys (Other Species–1) would provide the information necessary for USFWS and CDFG to determine which areas provide suitable foraging habitat for California leaf-nosed bats. IID will mitigated for permanent loss of foraging habitat for California leaf-nosed bats by acquiring or granting a conservation easement on other suitable foraging habitat within 5 miles of identified roost sites at a 3:1 ratio for the acreage impacted.

Day and night roosts are important habitat features for California leaf-nosed bats. Because of the scarcity of suitable roosting sites and uncertainty about the number and distribution of suitable roosts in the HCP area, IID will obtain written approval from the USFWS and CDFG if it proposes to impact a roosting site. In deciding whether to approve the request, the USFWS and CDFG will consider the availability of other roosting sites in the HCP area and the overall status of the species. The baseline surveys (Other Species–1) will provide the information necessary for USFWS and CDFG to determine if a roosting site could be impacted without causing substantial adverse effects to the species. Because of the scarcity of suitable maternity roosts due to strict thermal requirements, no impacts to maternity roosts would be authorized.

To mitigate the impact to California leaf-nosed bats from impacts to roosting sites, if approved by the USFWS and CDFG, IID would acquire, protect and manage in perpetuity one day roosting site for every day roost site eliminated. With the requirement for IID to receive approval from the USFWS and CDFG prior to eliminating a roost site and the requirement to protect at least one roost site for every one eliminated, the number of roost sites that could be impacted will be limited. The long-term protection of roosting sites, in the event that a site would be removed, would offset impacts to California leaf-nosed bats by providing roost sites for this species in perpetuity. Further, USFWS and CDFG would not approve impacts to a roost site if it would substantially adversely affect the species. Based on the expected low level of use of the HCP area by California leaf-nosed bats, the potential for take of this species is low. This assumption will be evaluated as part of the Other Species Conservation Strategy and the HCP IT may revise the avoidance, minimization, and mitigation measures if necessary to improve the effectiveness and efficiency of the measures. Implementation of the HCP would not jeopardize the continued existence of California leaf-nosed bats.

### 3.9.2.7 Pallid Bat

The pallid bat is most often found in arid, low-elevation habitats, including grasslands, shrublands, woodlands, and forests. Day roosts include caves, crevices, mines, trees, and buildings. Night roosts are generally in more open sites and are near day roosts. Horizontal crevices with stable temperatures are preferred day roosts in summer; vertical crevices with fluctuating temperatures are preferred during cooler periods. Pallid bats primarily forage on ground-dwelling arthropods, such as scorpions, crickets, and grasshoppers but also take large moths. Foraging occurs in and among vegetation as well as on the ground surface.

Pallid bats are well adapted to human environments and frequently use buildings, bridges, and trees as roosts. Thus, they could roost throughout the HCP area. Foraging may also

occur throughout the HCP area in any habitat where insect prey is abundant, including agricultural areas, wetlands, riparian areas, canals drains, and desert scrub. As part of the species-specific study program implemented under Other Species–1, foraging habitat for this species in the HCP area would be determined.

Potential impacts of IID's covered activities on this species relate principally to removal of foraging habitat or roosting sites. Under the Desert Habitat Conservation Strategy, IID would restrict O&M to previously disturbed areas (Desert Habitat–2). Similarly, IID would restrict scheduled construction activities to previously disturbed areas to the extent possible (Desert Habitat–3) and would not remove more than 100 acres of native desert habitat (Desert Habitat–5). Permanent loss of desert habitat would be mitigated by acquisition and long-term protection of native desert habitat. Under the Tamarisk Scrub Habitat Conservation Strategy, permanent removal of habitat would be mitigated by creation/acquisition and long-term protection of native tree habitat. Collectively, these measures would minimize and offset potential impacts to pallid bats resulting from impacts to foraging habitat.

Drain maintenance activities could result in a temporary or permanent loss of foraging habitat used by pallid bats. On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. Some of this vegetation might be suitable foraging habitat for pallid bats. Since pallid bats also forage over agricultural lands, fallowing could result in a loss of foraging habitat. Given the abundance of agricultural habitat in the HCP area, individuals would be expected to be able to find alternative foraging locations.

Under the HCP, IID will create at least 190 acres and up to 652 acres of managed marsh habitat (Drain Habitat–1). The created habitat would be of better quality than would be affected during drain maintenance. Further, the drains would continue to support vegetation similar to existing conditions and foraging habitat for pallid bats would continue to be available. Therefore, the created marsh would act to increase the amount of foraging habitat for pallid bats in the HCP area and thereby benefit the species.

Day and night roosts are important habitat features for the pallid bat. Over the term of the permit, IID anticipates conducting various construction activities which could remove roost sites for pallid bats. Because of the scarcity of suitable roosting sites and uncertainty about the number and distribution of suitable roosts in the HCP area, IID will obtain written approval from the USFWS and CDFG if it proposes to impact a roosting site. In deciding whether to approve the request, the USFWS and CDFG will consider the availability of other roosting sites in the HCP area and the overall status of the species.

To mitigate the impact to pallid bats from removal of roosting sites, IID would replace every roost site eliminated with a suitable roost (approved by CDFG and USFWS) in the immediate vicinity. With the requirement for IID to receive approval from the USFWS and CDFG prior to replacing a roost site and the requirement to replace one roost site for every one eliminated, the number of roost sites that could be impacted will be limited. The long-term protection of roosting sites would offset impacts to pallid bats by providing roost sites for this species in perpetuity. Further, USFWS and CDFG would not approve removal of a roost site if it would substantially adversely affect the species.

Avoidance, minimization and compensation for effects to foraging habitat and avoidance and compensation for impacts to roost sites would minimize and mitigate the impact of any take of this species resulting from the covered activities. Implementation of the HCP would not jeopardize the continued existence of pallid bats.

#### 3.9.2.8 Pale Western Big-Eared Bat

Pale western big-eared bats can be found in a variety of habitats but are most commonly associated with Mojave mixed scrub (e.g., sagebrush, sagebrush-grassland, blackbrush, and creosote-bursage) and lowland riparian communities. Separate day and night roosts are used. Day roosts are in caves, mines, or tunnels. Hibernation roosts are cold, but stay above freezing (Zeiner et al. 1990) and must be quiet and undisturbed. Maternity roosts are generally located in mines and caves. The determining factor for maternity roost site selection may be temperature related. In California, maternity roosts are generally warm; the species appears to select the warmest available sites, some of which reach 30°C (86°F) (Pierson et al. 1991). Night roosts may be in buildings or other structures. Separate hibernation and maternity roosts are often used. Foraging takes place over desert scrub, riparian habitats, or open water within 15 miles of the roost sites.

Pale western big-eared bats use caves and mines for roosting. No mine shafts occur in the HCP area. Pale western big-eared bats could forage throughout the HCP area, although they probably would concentrate foraging activities along the LCR, Salton Sea, New and Alamo rivers, agricultural drains, and water conveyance canals, given this species' association with water. Tall trees, bridges, and buildings could be used as night roosting sites.

Potential impacts of IID's covered activities on this species relate principally to removal of foraging habitat or roosting sites. Under the Desert Habitat Conservation Strategy, IID would restrict O&M to previously disturbed areas (Desert Habitat–2). Similarly, IID would restrict scheduled construction activities to previously disturbed areas to the extent possible (Desert Habitat–3) and would not remove more than 100 acres of native desert habitat (Desert Habitat–5). Permanent loss of desert habitat would be mitigated by acquisition and long-term protection of native desert habitat. Under the Tamarisk Scrub Habitat Conservation Strategy, permanent removal of habitat would be mitigated by creation/acquisition and long-term protection of native tree habitat. Collectively, these measures would minimize and offset potential impacts to pale western big-eared bats resulting from impacts to foraging habitat.

Drain maintenance activities could result in a temporary or permanent loss of foraging habitat used by pale western big-eared bats. On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. Some of this vegetation might be suitable foraging habitat for pale western big-eared bats.

Under the HCP, IID will create at least 190 acres and up to 652 acres of managed marsh habitat (Drain Habitat–1). The created habitat would be of better quality than would be affected during drain maintenance. Further, the drains would continue to support vegetation similar to existing conditions and foraging habitat for pallid bats would continue to be available. Therefore, the created marsh would act to increase the amount of foraging habitat for pale western big-eared bats in the HCP area and thereby benefit the species.

The species-specific study program for the pale western big-eared bat will determine which areas are important as roosts, and foraging grounds in the HCP area. If any of the covered activities under the HCP would result in permanent loss of roost sites or important foraging habitat, IID would protect other roosts or foraging habitat at a 1:1 ratio. Based on the expected low level of use of the HCP area by pale western big-eared bats, the potential for take of this species is low. This assumption will be evaluated as part of the Other Species Conservation Strategy and the HCP IT may revise the avoidance, minimization, and mitigation measures if necessary to improve the effectiveness and efficiency of the measures. Implementation of the HCP would not jeopardize the continued existence of this species.

### 3.9.2.9 Spotted Bat

Spotted bats have been found foraging in many different habitats, especially in arid or ponderosa pine forests, and marshlands. The habitat requirements and preferences of this species are varied and not well understood. Roost site localities are poorly known. This species is thought to use crevices and cracks in cliff faces, and occasionally caves and buildings, for roost sites. Roosts are often in the vicinity of open water.

Spotted bats could use much of the proposed project area since this species appears to be associated generally with open habitats. Foraging may be concentrated along waterways, such as the Salton Sea, New and Alamo Rivers, large canals, and agricultural drains. Potentially, spotted bats could roost at gravel quarries, highway bridges, or in buildings.

Day and night roosts are important habitat features for the spotted bat. Over the term of the permit, IID anticipates various construction activities. Construction to replace these structures could remove roost sites for spotted bats. Because of the scarcity of suitable roosting sites and uncertainty about the number and distribution of suitable roosts in the HCP area, IID will obtain written approval from the USFWS and CDFG if it proposes to impact a roosting site. In deciding whether to approve the request, the USFWS and CDFG will consider the availability of other roosting sites in the HCP area and the overall status of the species.

To mitigate the impact to spotted bats from removal of roosting sites, IID would replace every roost site eliminated with a suitable roost (approved by CDFG and USFWS) in the immediate vicinity. With the requirement for IID to receive approval from the USFWS and CDFG prior to replacing a roost site and the requirement to replace one roost site for every one eliminated, the number of roost sites that could be impacted will be limited. The long-term protection of roosting sites would offset impacts to spotted bats by providing roost sites for this species in perpetuity. Further, USFWS and CDFG would not approve removal of a roost site if it would substantially adversely affect the species.

Construction to replace structures along the AAC could remove foraging habitat and result in take of spotted bats. Under Desert Habitat–5, IID has committed to permanently remove no more than 100 acres of native desert habitat. This constitutes a very small amount of the available foraging habitat. Thus, the potential loss of foraging habitat for spotted bats would be considerably less than 100 acres and would not be expected to substantially affect foraging opportunities for this species.

Drain maintenance activities could result in a temporary or permanent loss of foraging habitat used by spotted bats in the drains. On an annual basis, IID conducts drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. Some of this vegetation might be suitable foraging habitat for spotted bats. Under the HCP, IID will create at least 190 acres and up to 652 acres of managed marsh habitat (Drain Habitat–1). The created habitat will be of better quality than that affected through drain maintenance. Further foraging habitat for spotted bats would continue to be available in the drains. Therefore, the created marsh would act to increase the amount of foraging habitat for spotted bats in the HCP area and thereby benefit the species.

The species-specific study program for spotted bats will identify areas that are important as roosts, and foraging grounds in the HCP area. If any of the covered activities under the HCP would result in permanent loss of roosts or important foraging habitat, IID would protect other roosts or foraging habitat at a 1:1 ratio. Based on the expected low level of use of the HCP area by spotted bats, the potential for take of this species is low. This assumption will be evaluated as part of the Other Species Conservation Strategy and the HCP IT may revise the avoidance, minimization, and mitigation measures if necessary to improve the effectiveness and efficiency of the measures. Implementation of the HCP would not jeopardize the continued existence of spotted bats.

#### 3.9.2.10 Western Small-Footed Myotis

The small-footed myotis occurs in a wide variety of habitats, primarily in relatively arid, open stands in forests, woodlands, and brushy uplands near water. The small-footed myotis can be found roosting in caves, buildings, crevices, and under loose bark. Occasionally, it will also roost under bridges. Hibernation takes place in caves and mines. Summer roosts are in crevices, cracks, holes, under rocks, and in buildings. Areas adjacent to the Salton Sea and along the New and Alamo Rivers, agricultural drains, and possibly the water conveyance canals may be used for foraging. Because this species uses a wide variety of natural and man-made structures for roosts, suitable roost sites could occur throughout the proposed project area.

Day and night roosts are important habitat features for the western small-footed myotis. Over the term of the permit, IID anticipates various construction activities that could remove a roost site for small-footed myotis. Because of the scarcity of suitable roosting sites and uncertainty about the number and distribution of suitable roosts in the HCP area, IID will obtain written approval from the USFWS and CDFG if it proposes to impact a roosting site. In deciding whether to approve the request, the USFWS and CDFG will consider the availability of other roosting sites in the HCP area and the overall status of the species.

To mitigate the impact to western small-footed myotis from removal of roosting sites, IID would replace every roost site eliminated with a suitable roost (approved by CDFG and USFWS) in the immediate vicinity. With the requirement for IID to receive approval from the USFWS and CDFG prior to replacing a roost site and the requirement to replace one roost site for every one eliminated, the number of roost sites that could be impacted will be limited. The long-term protection of roosting sites would offset impacts to small-footed myotis by providing roost sites for this species in perpetuity. Further, USFWS and CDFG would not approve removal of a roost site if it would substantially adversely affect the species.

Various construction activities anticipated by IID have the potential to remove tamarisk scrub habitat that could be used during foraging by western small-footed myotis. Because of the abundance of tamarisk scrub habitat in the HCP area (over 7,500 acres) and small amount of habitat the would be permanently impacted by construction activities over the term of the permit, the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal.

Native tree habitat would be created or acquired, and preserved to replace any tamarisk scrub habitat that would be permanently lost as a result of the construction activities (see Tree Habitat–1 and –2). As part of the Salton Sea Habitat Conservation Strategy, native tree habitat also would be created or acquired, and preserved if a net loss of tamarisk scrub habitat occurs within the shoreline strand or adjacent wetlands. Consisting of native plant species, the created or acquired habitat would be expected to provide better habitat quality for western small-footed myotis than the tamarisk scrub that would be lost. The creation or acquisition of native tree habitat under Tree Habitat–1 and –2 and Salton Sea–3 would offset any reduction in habitat value for small-footed myotis resulting from reductions in the amount of tamarisk scrub, thus mitigating the impact of take potentially resulting from changes in habitat.

The species-specific study program for small-footed myotis could show that other areas in the HCP area are important as roosts, or foraging grounds. If the covered activities would result in the permanent loss of roost sites or important foraging habitat, IID would protect other roosts or foraging habitat at a 1:1 ratio. Based on the expected low level of use of the HCP area by western small-footed myotis, the potential for take of this species is low. This assumption will be evaluated as part of the Other Species Conservation Strategy and the HCP IT may revise the avoidance, minimization, and mitigation measures if necessary to improve the effectiveness and efficiency of the measures. Implementation of the HCP would not jeopardize the continued existence of this species.

#### 3.9.2.11 Occult Little Brown Bat

The occult little brown bat occurs in a variety of habitats, including ponderosa pine forests, oak-pine woodlands (near water), and along permanent water or in riparian forests in some desert areas. It is usually closely associated with open water sources, such as rivers, ponds, or reservoirs (Hoffmeister 1986). It roosts in hollows in living or dead trees, under rocks or wood, or sometimes in buildings or mines (NMDGF 1997). This species seems to prefer human structures to natural ones for maternity roosts, and may use mines or caves for hibernation. Separate day, night, hibernation, and nursery roosts are used.

The Salton Sea, lakes, wetlands, rivers, canals, and agricultural drains may provide suitable foraging habitat for this species. Because this species uses a wide variety of natural and man-made structures for roosts, suitable roost sites could occur throughout the HCP area.

Day and night roosts are important habitat features for occult little brown bats. Over the term of the permit, IID anticipates conducting various construction activities that could remove roost sites for little brown bats. Because of the scarcity of suitable roosting sites and uncertainty about the number and distribution of suitable roosts in the HCP area, IID will obtain written approval from the USFWS and CDFG if it proposes to impact a roosting site. In deciding whether to approve the request, the USFWS and CDFG will consider the

availability of other roosting sites in the HCP area and the overall status of the species. Because of the scarcity of suitable maternity roosts, no impacts to maternity roosts would be authorized.

To mitigate the impact to occult little brown bats from removal of roosting sites, IID would replace every roost site eliminated with a suitable roost (approved by CDFG and USFWS) in the immediate vicinity. With the requirement for IID to receive approval from the USFWS and CDFG prior to replacing a roost site and the requirement to replace one roost site for every one eliminated, the number of roost sites that could be impacted will be limited. The long-term protection of roosting sites would offset impacts to little brown bats by providing roost sites for this species in perpetuity. Further, USFWS and CDFG would not approve removal of a roost site if it would substantially adversely affect the species.

The species-specific study program for the little brown bat could identify specific areas that are important as roosts, or foraging grounds. If a covered activity would result in the permanent loss of roosts or important foraging areas, IID would protect other roosts or foraging habitat at a 1:1 ratio. Based on the expected low level of use of the HCP area by occult little brown bats, the potential for take of this species is low. This assumption will be evaluated as part of the Other Species Conservation Strategy and the HCP IT may revise the avoidance, minimization, and mitigation measures if necessary to improve the effectiveness and efficiency of the measures. Implementation of the HCP would not jeopardize the continued existence of this species.

#### 3.9.2.12 Southwestern Cave Myotis

The southwestern cave myotis prefers arid habitats dominated by creosote bush, paloverde, brittlebrush, cactus, and desert riparian. Roosts are typically in caves or mines, but buildings and bridges have also been used. Dense, linear stands of mesquite, salt cedar, and catclaw acacia bordering the still water of oxbow ponds are considered optimal foraging areas (Vaughan 1959; Hoffmeister 1986). Hibernation caves have high humidity, often with standing or running water and little air movement. This species uses temporary night roosts. Nursery colonies are in the hibernation cave or another cave. Occasionally, other sites, such as bridges, are used. Optimal sites are relatively warm, with little human disturbance.

This species may have been extirpated from the HCP area by agricultural practices and habitat conversion (USFWS 1999). The extensive stands of salt cedar bordering the Alamo and New rivers could provide foraging habitat for this species. Some agricultural drains that support tamarisk and common reed could also provide suitable foraging habitat. Bridges and buildings throughout the area could be used as temporary roosting sites.

Potential impacts of IID's covered activities on this species relate principally to removal of foraging or roosting habitat. Under the Desert Habitat Conservation Strategy, IID would restrict O&M to previously disturbed areas (Desert Habitat–2). Similarly, IID would restrict scheduled construction activities to previously disturbed areas to the extent possible (Desert Habitat–3). Collectively, these measures would minimize the potential that IID's activities would impact foraging or roosting habitat for these bats.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace these structures could remove foraging habitat which could result in take of southwestern cave myotis. Under Desert Habitat–5, IID has committed to permanently remove no more than 100 acres of native desert habitat. Potentially impacted habitat would be distributed throughout the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals that are adjacent to desert habitat. Potential habitat for southwestern cave myotis in desert areas proposed for construction is limited to areas of desert dry wash woodland along the AAC and East Highline Canal. Thus, the potential loss of foraging habitat for southwestern cave myotis would be considerably less than 100 acres and would not be expected to substantially affect foraging opportunities for this species.

Various construction activities anticipated by IID have the potential to remove tamarisk scrub habitat that could be used during foraging by southwestern cave myotis. Construction activities could displace individuals and result in take if displaced bats were unable to find alternate habitat. Because of the abundance of tamarisk scrub habitat in the HCP area (over 7,500 acres) and small amount of habitat the would be permanently impacted by construction activities over the term of the permit, the amount of take potentially occurring from displacement of individuals as habitat is removed would be minimal.

As part of the species-specific study program implemented under Other Species–1, foraging habitat for this species in the HCP area will be determined. Prior to the start of construction activities, IID would determine if foraging habitat for cave myotis occurs within the construction area and would be impacted by construction activities. If construction impacts to foraging habitat cannot be avoided, IID will consult with CDFG and USFWS to identify other areas of suitable foraging habitat. The baseline surveys (Other Species–1) will provide the information necessary for USFWS and CDFG to determine which areas provide suitable foraging habitat for cave myotis. IID will compensate for permanent loss of foraging for cave myotis by acquiring or granting a conservation easement on other suitable foraging habitat within the immediate vicinity of identified roost sites at a 3:1 ratio for the acreage impacted.

The species-specific study program could identify important roost areas or habitats other than Desert Dry Wash that are important as foraging grounds. If a covered activity would remove an important roost or foraging habitat, IID would replace the roost or habitat through acquisition or creation at a 1:1 ratio. Based on the expected low level of use of the HCP area by southwestern cave myotis, the potential for take of this species is low. This assumption will be evaluated as part of the Other Species Conservation Strategy and the HCP IT may revise the avoidance, minimization and mitigation measures if necessary to improve the effectiveness and efficiency of the measures. Implementation of the HCP would not jeopardize the continued existence of southwestern cave myotis.

#### 3.9.2.13 Yuma Myotis

The Yuma myotis prefers cliffs and rocky walls near desert scrub, pinyon-juniper woodlands, and other open woodlands and forests. Like many bat species, it is closely tied to an open water source for foraging and drinking. The Yuma myotis roosts in narrow crevices in rock, bridges, buildings, and occasionally mines (Hoffmeister 1986). Preferred roosting habitats, however, are buildings and abandoned cliff swallows' mud nests. Separate daytime and night roosts are used.

The canals, rivers, lakes, and streams throughout the proposed project area offer suitable foraging habitat for the Yuma myotis. This species is relatively tolerant of human activity and may roost in houses, under bridges, or in other natural and man-made structures throughout the proposed project area.

Day and night roosts are important habitat features for Yuma myotis. Over the term of the permit, IID anticipates conducting various construction activities that could remove roost sites for Yuma myotis. Because of the scarcity of suitable roosting sites and uncertainty about the number and distribution of suitable roosts in the HCP area, IID will obtain written approval from the USFWS and CDFG if it proposes to impact a roosting site. In deciding whether to approve the request, the USFWS and CDFG will consider the availability of other roosting sites in the HCP area and the overall status of the species.

To mitigate the impact to Yuma myotis from removal of roosting sites, IID would replace every roost site eliminated with a suitable roost (approved by CDFG and USFWS) in the immediate vicinity. With the requirement for IID to receive approval from the USFWS and CDFG prior to replacing a roost site and the requirement to replace one roost site for every one eliminated, the number of roost sites that could be impacted will be limited. The long-term protection of roosting sites would offset impacts to Yuma myotis by providing roost sites for this species in perpetuity. Further, USFWS and CDFG would not approve removal of a roost site if it would substantially adversely affect the species.

The species-specific study program for the Yuma myotis will identify areas that are important as roosts, or foraging grounds in the HCP area. If any of the covered activities under the HCP would result in permanent loss of roost sites or important foraging habitat, IID would protect other roosts or foraging habitat at a 1:1 ratio. Based on the expected low level of use of the HCP area by Yuma myotis, the potential for take of this species is low. This expectation will be evaluated as part of the Other Species Conservation Strategy and the HCP IT may revise the avoidance, minimization, and mitigation measures if necessary to improve the effectiveness and efficiency of the measures. Implementation of the HCP would not jeopardize the continued existence of Yuma myotis.

#### 3.9.2.14 Western Mastiff Bat

Mastiff bats favor rugged, rocky areas in Sonoran Desert scrub habitats, where suitable crevices are available for day roosts (AGFD 1996). They inhabit crevices in cliff faces, high buildings, trees, and tunnels (Zeiner et al. 1990). Western mastiff bats forage in open areas, generally over mesquite as far as 25 miles from roost sites (Vaughan 1959; Jameson and Peeters 1988). Mastiff bats roost singly or in small colonies, sometimes with other bat species; several alternate day roosts may be used (Zeiner et al. 1990). Movement among different roost sites is thought to be influenced by temperature, as well as human disturbance (AGFD 1996). No roost sites have been identified in the HCP area.

Western mastiff bats are generally associated with open desert habitats near unobstructed waterways. In the HCP area, these types of habitats occur adjacent to the Salton Sea and along the All American, East Highline, and Westside Main Canals. The availability of suitable roost sites in the HCP area is unknown. Gravel quarries near the Salton Sea could provide roost sites as could a few rocky areas adjacent to the AAC. Other types of potential roost sites in the HCP area include bridges, buildings, and trees.

Potential impacts of IID's covered activities on this species relate principally to removal of foraging habitat. Under the Desert Habitat Conservation Strategy, IID would restrict O&M to previously disturbed areas (Desert Habitat–2). Similarly, IID would restrict scheduled construction activities to previously disturbed areas to the extent possible (Desert Habitat–3). Collectively, these measures would minimize the potential that IID's activities would impact foraging habitat for these bats.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace these structures could remove foraging habitat and result in take of western mastiff bats. Under Desert Habitat–5, IID has committed to permanently remove no more than 100 acres of native desert habitat. Potentially impacted areas would be distributed along the entire length of the AAC as well as along those sections of the East Highline, Westside Main, Thistle, and Trifolium canals that are adjacent to desert habitat. Potential foraging habitat for western mastiff bats in areas of proposed construction is limited to scattered areas of desert dry wash woodland along the AAC and East Highline Canal. Thus, the potential loss of foraging habitat for western mastiff bats due to construction would be considerably less than 100 acres and would not be expected to substantially affect foraging opportunities for this species.

As part of the species-specific study program implemented under Other Species–1, foraging habitat for this species in the HCP area will be determined. Prior to the start of construction activities, IID would determine whether foraging habitat for western mastiff bats occurs within the construction area and would be impacted by construction activities. If construction impacts to foraging habitat cannot be avoided, IID will consult with CDFG and USFWS to identify other areas of suitable foraging habitat. The baseline surveys (Other Species–1) will provide the information necessary for USFWS and CDFG to determine which areas provide suitable foraging habitat for western mastiff bats. IID will mitigate unavoidable and permanent impacts to western mastiff bats by acquiring or granting a conservation easement on other suitable foraging habitat within 25 miles of identified roost sites at a 3:1 ratio for the acreage impacted.

The species-specific study program for the western mastiff bat could identify other areas that are important as roosts or foraging grounds. If a covered activity would result in the permanent loss of a roost site or important foraging habitat, IID would protect other roosts or foraging habitat at a 1:1 ratio. Based on the expected low level of use of the HCP area by western mastiff bats, the potential for take of this species is low. This assumption will be evaluated as part of the Other Species Conservation Strategy and the HCP IT may revise the avoidance, minimization and mitigation measures if necessary to improve the effectiveness and efficiency of the measures. Implementation of the HCP would not jeopardize the continued existence of western mastiff bats.

#### 3.9.2.15 Pocketed Free-Tailed Bat

The pocketed free-tailed bat prefers arid lowlands, especially desert canyons, dominated by creosote bush or chaparral vegetation. Habitats used include pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis. This species prefers rock crevices in cliffs as roosting sites. The pocketed free-tailed bat reproduces in rock crevices, caverns, or buildings, and primarily feeds on moths and beetles.

Creosote scrub habitat is found in areas adjacent to the Salton Sea and along the AAC, Coachella, and Westside Main Canals. Areas along the New and Alamo Rivers and along larger drainages and canals may also provide foraging habitat. The availability of suitable roost sites in the proposed project area is unknown. Gravel quarries near the Salton Sea could provide suitable roost sites.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace these structures could remove foraging habitat which could result in take of pocketed free-tailed bats. Under the Desert Habitat Conservation Strategy, IID would restrict O&M to previously disturbed areas (Desert Habitat–2). Similarly, IID would restrict scheduled construction activities to previously disturbed areas to the extent possible (Desert Habitat–3) and would not remove more than 100 acres of native desert habitat (Desert Habitat–5). Permanent loss of desert habitat would be mitigated by acquisition and long-term protection of native desert habitat. Collectively, these measures would minimize and offset potential impacts to pocketed free-tailed bats resulting from impacts to foraging habitat.

Foraging habitat for pocketed free-tailed bats will be identified as part of the species-specific study program. If construction impacts to foraging habitat cannot be avoided, IID will consult with CDFG and USFWS to identify other areas of suitable foraging habitat. The study program (Other Species–1) will provide the information necessary for USFWS and CDFG to determine which areas provide suitable foraging habitat for pocketed free-tailed bats. IID will mitigate the permanent loss of foraging habitat for free-tailed bats by acquiring or granting a conservation easement on other suitable foraging habitat within the immediate vicinity of identified roost sites at a 3:1 ratio for the acreage impacted.

Day and night roosts are an important habitat feature for pocketed free-tailed bats. Because of the scarcity of suitable roosting sites and uncertainty about the number and distribution of suitable roosts in the HCP area, IID will obtain written approval from the USFWS and CDFG if it proposes to impact a roosting site. In deciding whether to approve the request, the USFWS and CDFG will consider the availability of other roosting sites in the HCP area and the overall status of the species. The species-specific study program (Other Species–1) will provide the information necessary for USFWS and CDFG to determine whether a roosting site could be eliminated without causing substantial adverse effects to the species. No impacts to maternity roosts would be authorized.

To mitigate the impact to pocketed free-tailed bats from removal of roosting sites, if approved by the USFWS and CDFG, IID would acquire, protect, and manage in perpetuity one roosting site for every roost site eliminated. With the requirement for IID to receive approval from the USFWS and CDFG prior to eliminating a roost site and the requirement to protect one roost site for every one eliminated, the number of roost sites that could be impacted will be limited. The long-term protection of roosting sites in the event that a site would be removed, would offset impacts to pocketed free-tailed bats by providing roost sites for this species in perpetuity. Further, USFWS and CDFG would not approve removal of a roost site if it would substantially adversely affect the species. Based on the expected low level of use of the HCP area by pocketed free-tailed bats, the potential for take of this species is low. This expectation will be evaluated as part of the Other Species Conservation Strategy and the HCP IT may revise the avoidance, minimization, and mitigation measures if necessary to improve the effectiveness and efficiency of the measures. Implementation of the HCP would not jeopardize the continued existence of pocketed free-tailed bats.

### 3.9.2.16 Big Free-Tailed Bat

Big free-tailed bats generally inhabit rugged rocky habitats, although a wide range of habitats, including desert scrub, woodlands, and evergreen forests, are visited during foraging and migration (Navo 1998b). Roosts are usually in buildings, caves, and rock crevices. Desert scrub, agricultural fields, wetlands, lakes, rivers, canals, and drainages where insects are abundant could provide suitable foraging habitat for migrating bats. Big free-tailed bats are known to migrate through the HCP area during the spring and fall (USFWS 1997). No roost sites are known to occur in the HCP area.

Over the term of the permit, IID anticipates replacing all of the structures along the AAC. Construction to replace these structures could remove foraging habitat which could result in take of big free-tailed bats. Under the Desert Habitat Conservation Strategy, IID would restrict O&M to previously disturbed areas (Desert Habitat–2). Similarly, IID would restrict scheduled construction activities to previously disturbed areas to the extent possible (Desert Habitat–3) and would not remove more than 100 acres of native desert habitat (Desert Habitat–5). Permanent loss of desert habitat would be mitigated by acquisition and long-term protection of native desert habitat. Collectively, these measures would minimize and offset potential impacts to big free-tailed bats resulting from impacts to foraging habitat.

As part of the species-specific study program implemented under Other Species–1, foraging habitat for big free-tailed bats in the HCP area will be identified. Prior to the start of construction activities, IID would determine if foraging habitat for big free-tailed bats occurs within the construction area and would be impacted by construction activities. If construction impacts to foraging habitat cannot be avoided, IID will consult with CDFG and USFWS to identify other areas of suitable foraging habitat. The baseline surveys (Other Species–1) will provide the information necessary for USFWS and CDFG to determine which areas provide suitable foraging habitat for big free-tailed bats. IID will mitigate for permanent loss of foraging habitat for free-tailed bats by acquiring or granting a conservation easement on other suitable foraging habitat within the immediate vicinity of identified roost sites at a 3:1 ratio for the acreage impacted.

While day and night roosts are an important habitat feature for big free-tailed bats, no roost sites are known to occur in the HCP area. Because of the scarcity of suitable roosting sites and uncertainty about the number and distribution of suitable roosts in the HCP area, IID will obtain written approval from the USFWS and CDFG if it proposes to impact a roosting site. In deciding whether to approve the request, the USFWS and CDFG will consider the availability of other roosting sites in the HCP area and the overall status of the species. The baseline surveys (Other Species–1) will provide the information necessary for USFWS and CDFG to determine whether a roosting site could be eliminated without causing substantial adverse effects to the species. No impacts to maternity roosts would be authorized.

To mitigate the impact to big free-tailed bats from removal of roosting sites, if approved by the USFWS and CDFG, IID would acquire, protect, and manage in perpetuity one roosting site for every roost site eliminated. With the requirement for IID to receive approval from the USFWS and CDFG prior to eliminating a roost site and the requirement to protect one roost site for every one eliminated, the number of roost sites that could be impacted will be limited. The long-term protection of roosting sites in the event that a site would be removed, would offset impacts to big free-tailed bats by providing roost sites for this species in

perpetuity. Further, USFWS and CDFG would not approve removal of a roost site if it would substantially adversely affect the species. Based on the expected low level of use of the HCP area by big free-tailed bats, the potential for take of this species is low. This expectation will be evaluated as part of the Other Species Conservation Strategy and the HCP IT may revise the avoidance, minimization, and mitigation measures if necessary to improve the effectiveness and efficiency of the measures. Implementation of the HCP would not jeopardize the continued existence of big free-tailed bats.

#### 3.9.2.17 Colorado River Hispid Cotton Rat

This species primarily occurs in grassland and mixed grassland/scrub habitats but may also occur in agricultural fields. It is most common in grassland and cropland habitats near water (Fleharty and Mares 1973; Kaufman and Fleharty 1974), including grass-forb understories in early successional stages of other habitats (McClenaghan and Gaines 1978). Tall, dense grass is preferred. Potential habitat for this species is widespread throughout the HCP area. Irrigated agricultural fields of alfalfa, wheat, sudangrass, and sugar beets provide suitable habitat for the cotton rat. Many drainages and ditches adjacent to agricultural fields include dense patches of common reed, a habitat known to be used by this species.

Colorado River hispid cotton rats could use the drains as habitat, but direct impacts to nests or adults could occur during drain maintenance activities. IID conducts annual drain maintenance activities on about 20 percent of the drainage system, affecting about 130 acres of vegetation. However, only a small amount of this vegetation likely would be suitable for hispid cotton rats. Drain maintenance activities and several other covered activities also have the potential to result in take of cotton rats through temporary or permanent reductions in the amount of drain habitat. As described in Section 3.5.2.2, various maintenance and water conservation activities have the potential to temporarily and permanently impact drain vegetation. In total, an estimated 25.1 acres of drain vegetation could be permanently impacted. These temporary and permanent reductions in drain habitat could result in a minor reduction in potential habitat for hispid cotton rats.

Under the HCP, IID will create at least 190 acres and up to 652 acres of managed marsh habitat (Drain Habitat–1). Based on the results of the species-specific study program, the HCP IT could configure a portion of the managed marsh habitat specifically to provide habitat for this species. Alternatively, at the HCP IT's recommendation and with the approval of the USFWS and CDFG, IID could acquire agricultural land adjacent to the managed marsh or elsewhere and manage the property to provide foraging habitat. Habitat would remain available in the drains; thus, the managed marsh or adjacent agricultural habitat would serve to increase the availability of habitat for this species in the HCP area.

Since hispid cotton rats also forage on agricultural lands, fallowing could result in a loss of foraging habitat. Potentially a few individual rats could be taken as a result of reduced foraging habitat in the HCP area. However, because of the abundance of foraging habitat in the HCP area, no adverse population-level effects would be expected.

Take resulting from drain maintenance could temporarily reduce the size of the hispid cotton rat population. However, because cotton rats are prolific breeders, the population would be expected to rebound quickly. In addition, if Colorado River cotton rats occur in the HCP area, then they have colonized and persisted in the HCP area coincident with IID